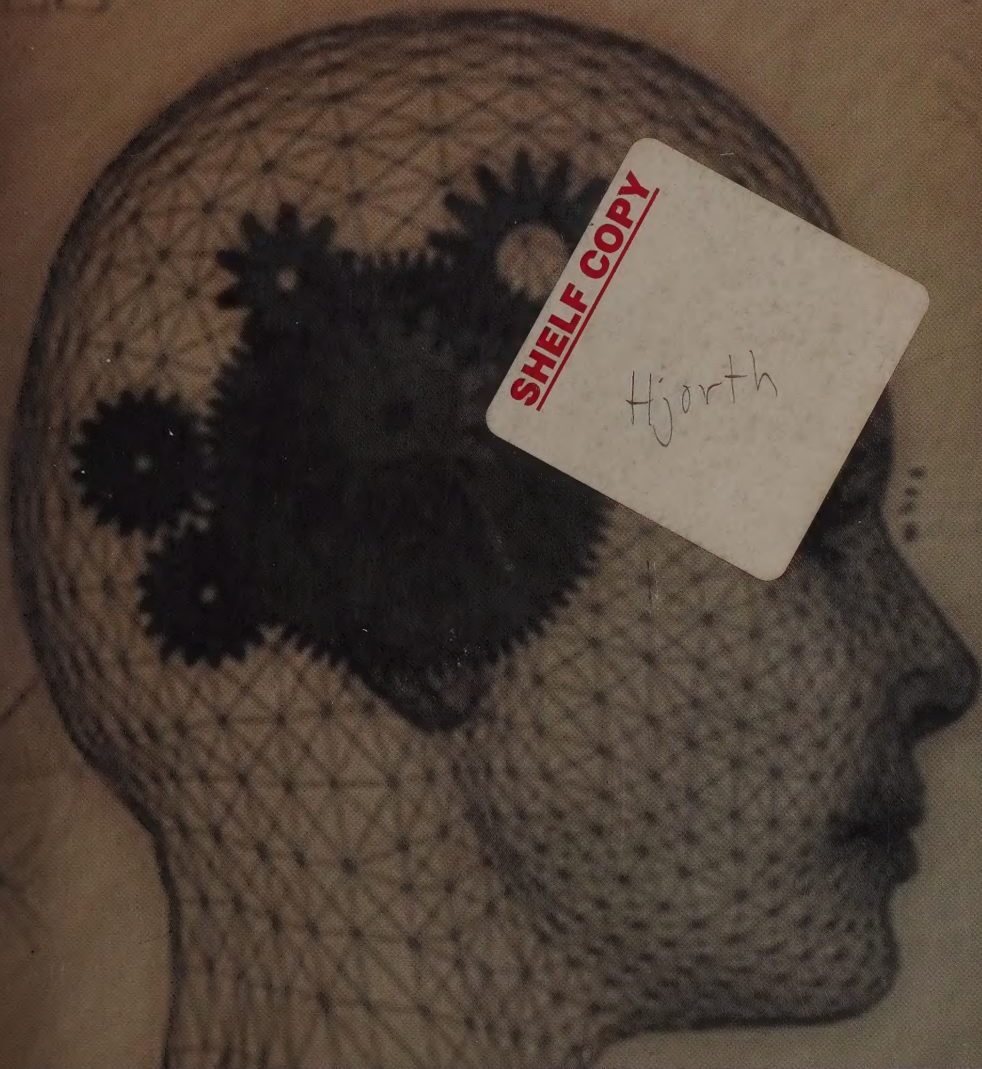


CRITICAL THINKING

& Problem Solving



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Critical Thinking and Problem Solving

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Introduction To the Student:

What are you thinking? Yes, right now. Your thoughts provide a map to your behaviors. As you think, you may act. As you think differently, intuitively, intellectually, inductively and deductively you may find that your thoughts and actions change. Thus, quality thinking, effective problem solving and strong academic skills go a long way to making dreams reality, and intentional actions. The purpose of this text is to increase the quality of your thinking, improve problems solving strategies and evaluate learning processes. Enjoy the challenges of learning and thinking “differently”

Linda Stevens Hjorth

PART I

Thinking Critically about Study Strategies

Taking Charge of Your Education

CHAPTER

1

Linda Stevens Hjorth

QUICK CHECK

List two questions that you would like to have answered about college.

1.

2.

Starting college provides a new beginning. Each day that you attend classes and study hard, you will find your dreams developing. Because the college environment is quite different from what you are used to, you may have questions.

- ▶ Why am I really here?
- ▶ How can I make the most of college?
- ▶ How can I keep my motivation strong?
- ▶ How can I manage my time well enough to balance the academic, personal, and health aspects of my life all at once?
- ▶ What can I do when I get nervous during tests?
- ▶ How can I create and maintain strong relationships while in school?
- ▶ How can I take more effective notes?
- ▶ How can I read to increase my understanding?
- ▶ How can I keep my learning skills on target?
- ▶ What can I do to increase memory retention?

Each of these questions, and many more, will be answered as you work your way through this book. Think of this book as a motivational guide. It will support you as you solve problems, create, strive, take risks, achieve goals, and claim your victories.

Whatever your reasons for being in college, it is no doubt a new experience for you. The challenges and frustrations that you face in the semesters to come will not only help you discover new ideas and knowledge, they will assist you in understanding things about yourself and your own inner strengths. As you work to achieve a college education, you will find that every formula that makes sense to you, every book that becomes part of your personal knowledge, every teacher whose teaching style you understand, will become a personal victory. Enjoy and take pride in each of these accomplishments.

The meaning of victory is different for everyone. Your victory might be as simple as accomplishing the goals or expectations you have for yourself. Victory can also refer to your ability to make the best things happen in life. Or victory may be a developmental quest that changes with each age and stage in your life. Obviously, the victory that you were aiming for at age fourteen is not the same one you are striving to achieve today.

Okay, But Why Did You Come to College?

You probably came to college to increase your likelihood of success. Yet success means different things to different people. What does success mean to you? Maybe success means being able to learn, to think different thoughts, or to make a good living. The following paragraphs explore possible reasons for your presence in college.

To Think New Thoughts

To some, the most important reason for being in college is to learn. An education provides the opportunity to learn and keep on learning. Through classes and exposure to a multitude of ideas, education becomes invaluable. You might say that after college you will never think quite the same way again. Discovering scientific facts, reading literature written in the Roman era, evaluating paintings, participating in discussions with professors, or listening to classical music may cause transformations in thinking. Why? Because exposure to new and different ideas is challenging and exciting, and creates an empowering kind of thinking.

To Increase Income and Chances for Employment

Achieving a college education enables students to find a variety of career-related positions while attaining a higher monetary gain. The fact that you succeeded in college proves to potential employers that you know how to learn and that you can apply the knowledge you gained in various career settings. College increases your writing, speaking, analytical, and mathematical skills, and learning about music, art, and literature helps you become a more well-rounded person. The courses in your major allow you to learn in-depth information that will support a specific body of knowledge and future career requirements. In many ways, the information learned in college nourishes the life that you want to live in the future.

To Learn More about Yourself

Achieving an education encourages learning about yourself. Each time you find an answer to a problem, create a superb essay, or master new research ideas, you are altering your self-perceptions. Through knowledge comes self-understanding. College provides a chance to increase self-esteem while learning new concepts. The college experience provides a chance to prove your self-worth while exploring new avenues for learning.

POTENTIAL SALARIES FOR ENTRY-LEVEL COLLEGE GRADUATES

Bachelor's Degree	Salary
Chemical engineering	\$43,762
Electrical engineering	40,397
Computer engineering	39,583
Computer science	35,925
Management information systems	38,475
Accounting	35,925
Business	29,784
Liberal arts	28,875

Source: National Association of Colleges and Employers. Adapted from the *Chicago Tribune*, March 16, 1998, Business, p. 2.

To Find Inspiring Jobs after Graduation

College graduates are more likely to find jobs that they enjoy. They often find themselves in positions of responsibility, power, and influence, participating in activities that are based on their interest and education and that are rewarding on a daily basis. Their education provides them with a ticket of entry into positions that might otherwise be closed to them. Attending college is more than getting a degree to get a job. It is an experience that will aid in intellectual growth, emotional change, and behavioral adaptations leading to goal achievement.

To Learn from Others

The people who surround you on your college campus can provide great opportunities to learn. By asking questions and seeking information from classmates, professors, and staff, you can gather a wide array of opinions and experiences that increase your understanding of life issues. Through interactions you will learn of new cultures, new foods, new languages, and new thoughts; this experience enhances your entire college education and your life.

Learning Styles: How Do You Learn Best?

Do you sit in the front row of the lecture hall, listening attentively, writing notes, and remembering 80 percent of what you heard? Do you sit in the middle row, writing down everything on the board, and then study it? Do you write everything on cards, throw the cards on the floor, stomp on them, and then ask yourself questions about each card?

The answer that best describes you correlates to your learning style. When you understand how you learn best, you will need to spend less time studying because you will be studying in the style that is most comfortable and productive for you.

Part of creating victories is understanding yourself and your ability to learn. You will be able to use this knowledge to your advantage to obtain an education and to prepare for a career. You will probably have a favorite learning style, or you may combine various learning styles in different situations. In labs you need to be a hands-on, kinesthetic learner. In lectures, auditory learning skills are crucial. Knowing your learning style and how to use it effectively brings out the best in you. Take the Learning Style Questionnaire on page 000 to find out what kind of learner you might be.

What Learning Style Works Best for You?

VISUAL LEARNERS learn best through visual stimuli such as reading, watching, or visually imagining concepts.

Visual Learning

Visual learners read, see, or visually imagine concepts in order to recall them. Seeing concepts creates greater understanding and memory retention. Visual learners prefer instructors who write notes on the board or conduct demonstrations. They would rather study their own notes than listen to a lecture or a study group conversation. This is the type of person who may even say, "Please write down what you just said, so that I can understand it better."

The visual learner often speaks in descriptive terms. Directions from a visual learner might be, "Go to the old oak tree and turn right, then go to the red brick schoolhouse and turn left." If you learn best visually, you probably enjoy reading and examining graphs, drawings, visual aids, and diagrams. You may also learn more from demonstrations and step-by-step diagrams written on the board than from lecture-oriented classes.

Auditory Learning

AUDITORY LEARNERS learn best through hearing.

Auditory learners grasp and comprehend information extensively through hearing. For example, knowledge levels are increased by reading aloud notes or assignments.

LEARNING STYLE QUESTIONNAIRE

Answer this questionnaire to gather an introductory understanding of your learning style. Mark the answer that best describes you.

1. I learn best when
 - a. I can see a diagram or description of the concept.
 - b. I hear the concept presented on tape or in lecture.
 - c. I can become actively involved in the concept.
2. I prefer
 - a. to learn from instructors who use a computer in the classroom to show concepts from the Internet.
 - b. to listen to a lecture rather than read the text.
 - c. lab experiments.
3. I like classrooms in which I can
 - a. sit in the front row so that I can see everything.
 - b. clearly hear the instructor.
 - c. maintain my attention level through hands-on-experience.
4. I like group activities in the classroom because
 - a. I can see different responses written to the instructor's questions.
 - b. I can hear different viewpoints.
 - c. I can become more involved in the learning environment.
5. I usually like
 - a. reading an assignment.
 - b. listening to my classmates summarize readings rather than being involved in group activities.
 - c. in-class assignments that involve a lot of activities.
6. I like to learn by
 - a. seeing.
 - b. hearing.
 - c. becoming active in the learning process.
7. Test taking is easier for me when I can
 - a. visualize where the answer to the question was in the text.
 - b. prepare by studying with others and hear them orally repeating concepts that we need to know.
 - c. write potential test questions down and answer them in a written format.
8. When studying I would much rather
 - a. see a movie or watch a distance learning seminar than hear an audiotape.
 - b. listen to a lecture or discussion than work in a lab.
 - c. participate in a lab assignment than read a textbook assignment.
9. My philosophy on learning is
 - a. if I listen attentively to a lecture, I will understand it.
 - b. if I see a diagram explaining the lecture, my comprehension increases.
 - c. if I can take a concept that I need to learn for class and turn it into a song, I learn it better (especially when I sing it repeatedly in the shower).
10. Comprehension is increased when
 - a. the professor writes down an explanation of a difficult subject.
 - b. I listen to a study tape that I created while I do the dishes or work in the garden.
 - c. I jump rope and practice the terms for the class at the same time.
11. Learning is a continuous lifelong process that is made easier by
 - a. reading.
 - b. lectures.
 - c. laboratory assignments.

If most of your responses were "a," you may be a visual learner, "b," you may be an auditory learner; "c," you may be a kinesthetic learner.

Conversations increase the knowledge level of the auditory learner. This is the type of person who will listen attentively in class when the instructor lectures but loses interest when concepts are written on the board with no discussion. If you learn best as an auditory learner, then you probably prefer discussions, lectures, study groups, and recitation.

Kinesthetic Learning

KINESTHETIC LEARNERS learn best through action and hands-on activities.

Kinesthetic learners master information best through activity or hands-on experience. Handling and touching increase learning. Some kinesthetic learners, for example, cannot tell you a friend's telephone number without first punching out the numbers on an imaginary phone in front of them. The activity of pretending to dial a phone provides memory cues to stored information. For kinesthetic learners, actions stimulate understanding and memory. This is the type of person who might sit in a computer lecture and be very confused. Once the theory can be implemented in a computer lab, great understanding takes place. Kinesthetic learners learn best with tasks that are hands-on (laboratories, mechanics, computers, cooking, simulations). If you are a kinesthetic learner, you probably prefer recording and writing information, and correlating what you learn in class to true-life situations.

Some students find that they do not have one dominant learning style; instead they rely on all three. Whether you are primarily a visual, an auditory, or a kinesthetic learner, understanding is increased through analysis and critical thinking. Questioning, wondering, pondering, thinking, and rethinking enhance learning in all learning styles. Critical thinkers do not accept concepts at face value; they want to know more through introspection. Those who take time to reflect on readings and to understand more completely the ideas to which they are exposed will increase their learning skills no matter which learning style is their primary one.

Right-Brain, Left-Brain Learning

Another factor that relates to learning style is brain-dominance theory. Each hemisphere of the brain controls certain parts of your personality, thinking, and behavior. By understanding if you are right-brain dominant or left-brain dominant, you will be more aware of your learning and working patterns. Fill out the Right-Brain/Left-Brain Questionnaire to find out what your dominant learning mode might be.

Those who are **LEFT-BRAIN DOMINANT** are logical, serious, knowledgeable, linear in thinking, structured, organized, and rational.

Are you a left-brain learner? Those who are left-brain dominant are often logical, serious, knowledgeable, structured, organized, and rational. They often think in a linear, organized fashion. Sporadic unorganized thoughts are foreign to them. They enjoy learning facts, analyzing in a concrete format, and maintaining a sense of order. They like to read music, use names to describe and define things, and respond to lists. Left-brain dominance encourages fact-oriented thinking and reasoning. Left-brain learners are more likely to create and follow time management charts, have a neat study area, and finish projects ahead of time.

Those who are **RIGHT-BRAIN DOMINANT** are intuitive; have little sense of time; enjoy music, clutter, and creative thinking; makes decisions based on hunches and emotions; and use holistic thinking.

Are you a right-brain learner? Right-brain-dominant people respond to feelings, are intuitive, have little sense of time, and use parallel thinking (the conclusions come before or with the facts). They do not mind clutter and are creative in thinking processes. They like to be playful, intuitive, and spontaneous; they enjoy drawing and doing physical activities. They often make decisions based on abstract thinking, hunches, and emotions, or on "the whole picture" (Matte, 1995; Shepherd, 1998; Ferrett, 1997).

If you can learn to use both sides of your brain, you may find that you can expand your skills, thinking processes, and formats for organization. By striving to acknowledge and empower skills from both cerebral sides, you are opening yourself to the creation of new study strategies and lifelong learning skills.

QUICK CHECK

Do you think you are a right-brain or a left-brain thinker? Use examples to explain your answer.

Source: Adapted from Nancy Lightfoot Matte and Susan Hilary Green Henderson, *Success Your Style!* ©1885 Wadsworth Publishing Company. Adapted from James Shepherd, *College Study Skills*, Sixth Edition. Copyright © 1998 by Houghton Mifflin Company.

RIGHT-BRAIN/LEFT-BRAIN QUESTIONNAIRE

The following is a list of statements. Mark the ones that best describe you.

1. When I study I
 - a. take a logical, problem-solving approach to understanding concepts presented in lecture.
 - ☒ b. daydream and think about information presented in lectures.
2. When playing music I
 - a. read it.
 - ☒ b. recognize and remember melodies and musical chords.
3. When studying, my desk is usually
 - a. organized.
 - ☒ b. scattered with many things.
4. I respond well to
 - a. facts.
 - ☒ b. feelings.
5. I take pride in understanding
 - a. verbal communication very well.
 - ☒ b. nonverbal behaviors and emotions very well.
6. I like to
 - a. think rationally based on facts, reasons, and logic.
 - ☒ b. think intuitively based on premonitions, feelings, and emotions.
7. I like to
 - a. think and then act.
 - ☒ b. act and then think.
8. I like to
 - a. plan and schedule my time.
 - ☒ b. just let things happen; things will get done eventually.
9. I often
 - a. work on one project until it is finished.
 - ☒ b. jump from project to project.
10. I like to
 - a. listen, reflect, and then respond to others.
 - ☒ b. express my feelings and reactions without totally understanding the whole situation.

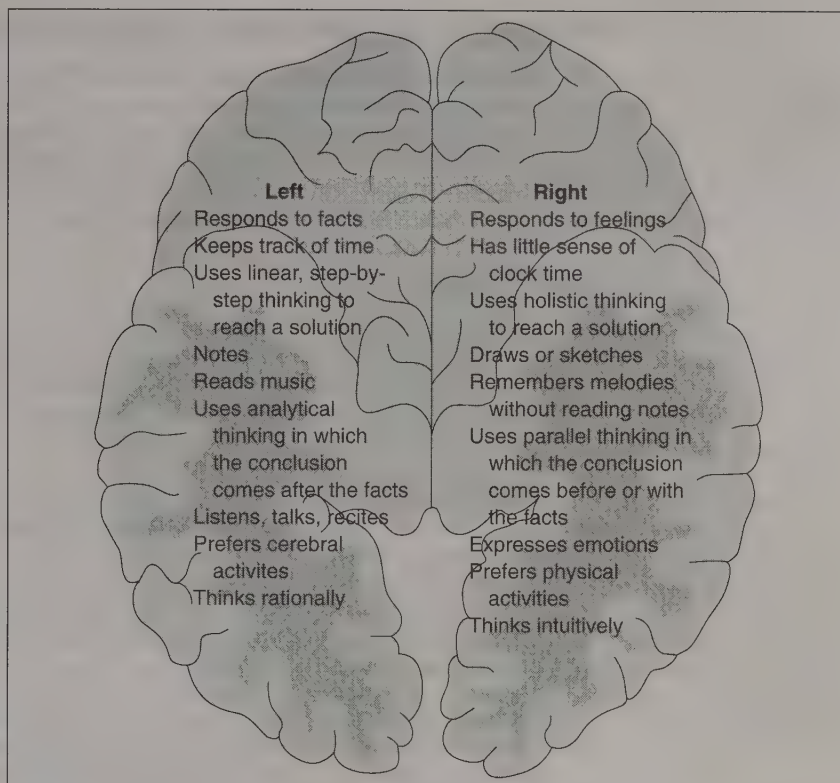
If most of your responses were "a," you are probably a left-brain thinker; "b," you are probably a right-brain thinker.

Take Charge of Your Education

Beyond understanding your learning style preference or the relationship between brain dominance and studying, it is also important to understand other factors that you can control when guiding your college decisions.

Step Inside Your College Community

Research shows that the more you connect with your college community, the more successful you will be throughout your academic life. By learning about the people, departments, services, and clubs at your college, it becomes easier to fit in and feel like a part of the college community. That is why each chapter in this book includes a Step Inside . . . section that describes various resources on campus that have been created to support your college success. By getting to know more about your college campus, your comfort level will increase, and little successes will build into college victories.



Characteristics attributed to the left and right side of the brain.

Source: Reprinted by permission from *Success Your Style!* by Nancy Lightfoot Matte and Susan Hilary Green Henderson. © 1995 Wadsworth Publishing Company

EXERCISE

How Do You Learn Best?

The purpose of this exercise is to correlate your learning style and brain dominance to effective study strategies.

When you took the Learning Style Questionnaire, did you discover that you are a visual, auditory, or kinesthetic learner? Are there times when you use all three learning styles?

When you took the Right-Brain/Left-Brain Questionnaire, did you discover that you are a left-brain or a right-brain thinker?

Discuss five specific ways that you could improve your study habits based on your new understanding of learning styles and brain-dominance theory.

1.

2.

3.

4.

5.

Ask Questions and Seek Answers

When things seem confusing, look for answers. Take responsibility and time to find solutions. Colleges are set up to answer questions and to help you become successful. The more you ask, the wiser you will be. There is no reason for you to walk around the hallways mumbling to yourself in frustration; instead, go into any office and ask your question. If you are in the wrong place, be assured that staff, faculty, or other students will direct you to the right place.

Keep All Papers

Keep *all* papers that you receive from the college. Whether they are graded assignments, financial aid forms, or registration guidelines, keep them in a folder with an appropriate title (e.g., English, loan forms, scholarship papers, registration forms). This will promote organization and prevent tie-ups when you need to speak with Financial Aid Office or Registrar Office staff.

Homework, Tests, Projects. Keep all papers handed back to you by your instructor. You can study them for future tests and, in the case of errors, learn the correct information. Secondly, such papers may serve as evidence if you believe the instructor has graded you incorrectly. If you receive a report card with a grade that you think could be mistaken, make an appointment to discuss it with the instructor. Most colleges have grade change deadlines; look in your student handbook to see what the policy is for your school.

Financial Aid Papers. You may receive many financial aid papers. Keep all of them. Find out the name of your financial aid advisor and post it in your address book or on your refrigerator for easy access. Pay special attention to payment dates; mark them on a calendar so that you will not have to pay late fees.

Go to Class

There is a direct correlation between grades and attendance. The more faithful your attendance, the higher your grades. If you miss class, you miss not only the lecture and discussion that will aid in your understanding of concepts but also pop quizzes, homework assignments, or in-class assignments. Missing any or all of these activities can lead to lower grades.

If you have to miss a class, check your student handbook for the attendance policy. Many instructors will list their attendance rules in the syllabus; check it to see if you are supposed to call them if you will not be in class.

Become Informed

Be aware of all policies. Do you know where you can park without being towed? Do you know what prerequisites you need before signing up for a specific course? Do you know what hours the library is open? By reading materials provided to you and by reviewing the handbook and the catalogue, you will be an informed student. The information that you learn now will prevent misinformation and confusion later.

Check Deadlines

When can you withdraw from a course without a penalty? When is the last date to add a course? When do you take proficiency exams? When do you have to make housing payments? Each deadline, if missed, will cause hassles or cost money. Get a calendar and mark deadlines on it now so you can be aware of them for the whole semester.

Budget Your Money

How much does it cost to live? List the amount that you spend on rent, utilities, phone, food, transportation, insurance, entertainment, clothing, laundry, and miscellaneous items. Add your expenses and compare them to your income. Create a budget based on these figures. By figuring out how much you spend monthly, you can more easily understand where your money goes and curtail your spending. To get some idea, look at the chart below that shows the average monthly expenses of students living away from home (Nelson, 1998).

QUICK CHECK

List the amounts that you pay for items mentioned in the average expenses chart. How do your costs differ?

Cut Costs Creatively. Find ways to spend less money. Locate banks that do not charge high service fees. Buy soap, razors, and shampoo in bulk. Try to find grocery stores that have double-coupon days so that you can save twice the amount on groceries.

If you feel you must eat out (eating out can destroy a budget), use coupons to reduce the price of your meal. Find restaurants that provide large servings and split one order with a friend. Reduce the number of times you eat out (e.g., try to eat out only once a month). If you have chosen the food plan at your dorm, eat in the dorm, not in restaurants, as much as possible (Nelson, 1998).

Check with Student Services to see if they have discount coupons for amusement parks, movies, concerts, and restaurants. Use public transportation, ride your bicycle, or walk to save wear and tear on your car as well as gas money. Check the car pool board to see who lives in your area and might be interested in sharing a ride. Before you buy, stop and think, "Do I have the money? If I do not, I will not buy it." "Can I live without this for a week? If so, I do not need to buy it now." Be careful that impulsive buying does not cause you to break your budget (Nelson, 1998; Flood, 1998).

Credit Cards Can Become Your Worst Enemy. Be cautious with credit cards. You may decide that you need one for emergencies. If so, that is all it should be used for. Often, credit card companies come to college campuses to lure students to apply for credit cards. Think about your budget; if you start to place charges on your new credit card, how will you pay them off? If most of your salary is now allotted for survival, do you think you will be able to pay your monthly credit card bill at 15 or 21 percent interest? Sometimes, credit card companies will give you a T-shirt, a water

AVERAGE MONTHLY EXPENSES OF STUDENTS LIVING AWAY FROM HOME	
Item	Cost
Rent or dormitory fees	\$248
Utilities and phone	96
Food	224
Transportation	46
Insurance	38
Entertainment	90
Clothing	101
Laundry and toiletries	20
Miscellaneous	—
Total	\$832

Source: U.S. Department of Labor, 1995 Consumer Expenditures Survey for the "Under 25" Age Group. Adapted from Anne Nelson, "Juggling the Costs of Living Away from Home," *Class of '99 Futures*, Spring 1998.

bottle, or a candy bar when you fill out the application. If you really want a T-shirt or a candy bar, buy it yourself instead; it will be less costly. Many students report that they signed up for a credit card and used it for anything they wanted—pizza, a new shirt, greeting cards, or going to amusement parks. They realized, too late, that paying off the credit card bill was going to be difficult and painful because the interest kept accruing and their credit card debt never seemed to end (Flood, 1998).

To pay off credit card debt, you might have to work more hours. This work time will take away from your study time. You may also find that worrying about how to pay it off will prevent you from being able to focus on studying. By making the choice to prevent credit card debt, you will be able to spend more time and focused energy on your studies and academic achievements.

Finding ways to take charge of your education will ensure your success in college. To continue your success, it is important to find ways to keep your motivation high.

Find Ways to Stay Motivated

Motivation exists within you and supports your desire to turn dreams into reality. It is nonmeasurable, yet it is one of the more powerful psychological factors that help you attain your goals. As you attend college, motivation directs how you handle classes, attendance, homework, tests, or relationships.

EXTRINSIC MOTIVATORS are factors outside you that prompt you to strive for goals.

There are extrinsic and intrinsic motivators. Extrinsic motivators come from outside of yourself: grades, pay, material rewards, social pressures. If a reward is important to you, it can be a great motivator. For example, if you have two kids, have lost your job, and are attending school, it will be extrinsically rewarding to find a job. It may even be more rewarding to find a position that will support you and your family and allow you to advance yourself through your education.

INTRINSIC MOTIVATORS are factors inside you that prompt you to strive for goals.

Intrinsic motivators come from inside yourself. Examples include enjoyment of work, pride in self-achievement, learning for the sake of learning. Intrinsic motivators exist at a feeling level. This feeling level can be so strong that once you make up your mind to achieve a specific goal, no outside influence will stop you.

An important part of claiming your victories is understanding what motivates you and how that motivation relates to your goals. Think about which intrinsic and extrinsic motivators are important to you. If you think that the most important motivation in college is to get good grades so that you can get a good job that pays well, you will be in possession of knowledge that is externally motivating (extrinsic motivation). On the other hand, if you know that the most important motivator for you is the enjoyment of learning, then you know that intrinsic motivation is important to you. There are times that you may be motivated by both intrinsic and extrinsic motivators.

Identifying factors that motivate you can help you keep on track in attaining your goals when you are struggling or frustrated. Knowing what motivates you is the key to staying motivated, even in the roughest situations. Why? Because each time the going gets tough, you can remind yourself of what you are working for and why it is so important. This reminder can serve as a motivator in itself. It can be useful to you whenever you begin to question your motivational level.

Many times, intrinsic and extrinsic motivators are in conflict. You may want to be a college graduate (extrinsic motivation), but *hate* spending time studying in the library on a beautiful day (intrinsic motivation). The question in this motivational conflict is which motivational factor will win? By thinking about your motivators and clarifying them, you may be able to create a clearer understanding of yourself and what helps keep you motivated. This process will aid you in achieving your goals and claiming your victories—large or small.

To understand the concept of intrinsic and extrinsic motivation further, answer the following questions. Mark “yes” if the statement describes you very well, and mark “no” if it does not.

Yes	No	
	☒	Do you make decisions in life based on what your friends, spouse, or family tell you to do?
	☒	Does what you see or hear in the media affect your goals?
	☒	Do you have a difficult time making decisions and look toward someone else to help you make up your mind?
☒		Are you motivated by the events around you? (For example, you plan on studying all night for your anthropology test; then your friends ask you to go out for pizza. Do you go?)
	☒	Do you make a decision and when someone tells you your decision was wrong, change your thinking to conform to his or her opinion?
	☒	When things go wrong, do you project your anger on others? (For example, when you fail your test, do you blame it on the teaching style of your instructor?)

QUICK CHECK

List one extrinsic and one intrinsic factor that motivates you.

1. _____

2. _____

If you answered yes to most of the questions, your motivation may be based on extrinsic motivators. Your decisions are based more on the factors and people around you than on the feelings and opinions that spring from within you. You may often value others' opinions more than your own. You may also blame others when things go wrong rather than look inside yourself to see what part you might have played in the problem.

If you answered no to most of the questions, then you are more likely a person who experiences intrinsic motivation. You make decisions based on your own perceptions, feelings, and reactions. You try to prevent the outside environment from controlling you. You acknowledge your feelings, and you acknowledge outside factors, but your decisions are based on your perception of the best action for the specific situation. You also realize that your perception of the negative events in your life, over which you have no control, can be dealt with only through understanding. You might not be able to change the event, but you can still keep your perceptions in check. You realize that worry and negative thoughts do not change difficult events, that it is your reaction to those events that can decrease their stressful impact and increase your motivation to prevent them from interfering with your successes.

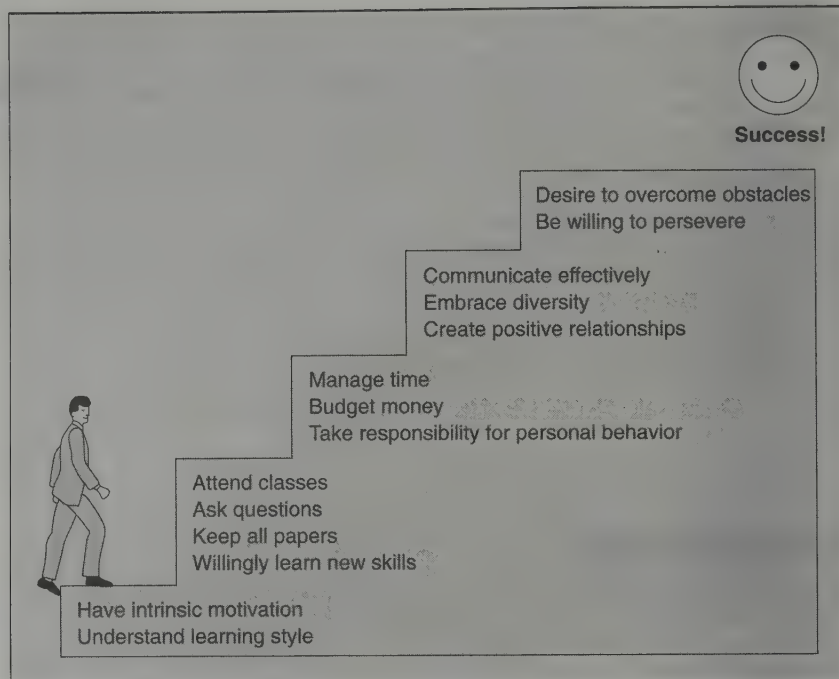
No one can give you motivation, and no one can take it away. Motivation lies within you. When you say, "I am just not motivated," it is important to remember that you are the only one who can rejuvenate motivation.

Diversity

How Would You Define Diversity?

Diversity exists around you. No matter where you are or what you are doing, there are always those who are different from you. Whether you are in class, in your community, or watching TV, you probably note differences in others. Not just skin color, body size, or the earring in an eyebrow—diversity is more than that. Diversity comprises all differences: personality, gender, interests, attitudes, food, religious beliefs, and more. Diversity champions individual differences. Part of learning in college is being exposed to different ideas, thoughts, and attitudes. When encountering differences, make it an opportunity to learn, adapt, and possibly alter your own opinion.

Sometimes students voice concern about being different from the majority of the class. They feel they are older, younger, or culturally or physically different. They are concerned, for example, that they will not be able to learn as quickly as



A student's success is often a step-by-step process that includes many factors.

younger students or that their language or physical barriers will prevent them from learning. In reality, students who see themselves in this light often experience high degrees of motivation and excel academically.

Formal institutional support systems are great. But do not forget to create and maintain friendships while in college. Your school is a good place to meet people from all over the world. Not only is it a great cultural experience but the support you receive from friends is often unmatched. Who understands your frustration in a class better than someone else in the same class?

By accepting differences, considering new ideas, and evaluating others' contributions based on their thoughts and originality, you will experience how powerful diversity can be. We live in a global village. This village allows for exploration of differences while considering new perspectives that empower you to grow, change, and learn. Sometimes, learning from others is just as powerful as book learning.

The College Challenge

There is no doubt that your college experience will be a challenge. It is a time of learning, exploring, and creating a new aspect of life. Know that no matter how tough it becomes, you can make it. By succeeding at college you are building your future. Much of what you learn here will be useful to you throughout your personal and professional life. So go ahead . . . take the challenge. It might be difficult, but you will not regret it.

Step Inside . . . Your College Campus

Take a step inside the various offices on your college campus. The college has set up services for you as a support to your academic endeavors. Do not pass by offices and wonder what they are about; go in, visit, and ask questions. The more you meet people on your campus and speak with them, the more you will feel like a part of the college community. The following is a sampling of resources available to you at your college. Search these resources out, ask questions, find out who else can help you be successful at your school.

Each college has different services, and yours may have names different from those presented here. Most of the services available are also listed in your Student Handbook. Do not allow yourself to wander around lost as a new student. College staff and faculty want to help you.

Faculty

Most instructors joined the teaching profession to share knowledge and help you learn. Tap into that knowledge by asking questions in class, and if you need additional information, make an appointment to see them after class or during office hours.

Teaching assistants (faculty assistants) may also be available for tutoring. Ask a faculty member or the secretary in the academic office about the availability of tutoring from the instructor's assistant.

Remember to ask for help before you start doing below-average work. Do not wait until midterms or finals to obtain help. It will be easier to be successful in the course if you do not fall too far behind. As soon as you receive a grade that you feel is unsatisfactory, seek help.

Student Services

Most campuses have a department that is set up to serve you. Make sure that you find it, and ask what services the staff members can offer. They may be able to provide information to you on campus counseling, part-time jobs, housing, student organizations, and community services. If you feel lost when you arrive at college, seek out this department. It may be the support system that you need to make yourself feel more comfortable on a new campus.

Academic Support Center

Although the name of this center might be different on various campuses, most colleges have one. It often offers tutoring, study skills seminars, and support to each student. It may also provide support, guidance, and learning strategies to the English-as-a-Second-Language student, the physically challenged student, or the student with learning disabilities.

Academic Advising

Advisors can make sure you are on the right track. They can help you determine if your academic load is too heavy, help you decide about changing your major, or provide suggestions on whom you can see for additional tutoring. Each campus has an advising office where you can obtain help in creating class schedules, choosing classes, or planning your college career. Staff members will provide information on the number of credits and courses you will need to graduate. They will also explain the prerequisites or requirements needed for each course to make the scheduling

QUICK CHECK

What is your advisor's name? room number? phone number?

.....

.....

.....

of your classes much easier. If you have questions about the level of courses that you are taking, or feel that you are taking too many courses, contact your advisor. Your advisor's name and phone number will be listed in the college catalogue.

Study Groups

Create a study group and meet with it regularly (at least once a week). Study groups can provide support in studying, getting over loneliness, finding your way around campus, and adjusting to a new environment. Do not underestimate the power of study groups. They provide the structure, knowledge, and support needed to achieve college goals. They will make copies of the notes you missed when you were sick. They will push you to study harder when you want to give up. Group members will listen when things get rough and explain perplexing concepts until they seem simple.

Study groups increase learning power. When you have four people reviewing the same subject, you learn faster than you can on your own. Another advantage is that you can help each other study because of individual strengths and weaknesses within the group. You might be great at math and not great at English, but another group member may be good at English and not good at math. Study groups compensate for each members' weaknesses while capitalizing on the group's strengths.

Besides, it is much more fun to study in a group. The group motivating factor is usually stronger than individual motivation. There may be times when you will not feel like studying, yet you need to. When a member of the study group calls you and says, "We are all at McDonald's studying. Where are you?" it may give you the motivation to get out of bed and get moving. Group members can push you gently and quiz you into learning material. Reach out to others and form a study group; the benefits will be never ending.

Career Counseling

Staff members in this office can help you find a full-time, co-op, or part-time job. They can offer you advice on career opportunities before and after graduation. They can also help you create a dynamic résumé and teach you appropriate interviewing skills. The placement office may provide you with opportunities to meet with company recruiters or schedule job interviews for you when you are close to graduation.

Financial Aid Office

You will want to visit this office when you have questions about scholarships, school loans, or grants. The staff in this office will work with you to help you find financial assistance. Before you drop out of school because of money problems, be sure to visit the Financial Aid Office. The staff has the expertise to help you evaluate your financial situation more objectively.

Be sure to look around campus for support systems, because they do exist. It is up to you to use them. Your first college semester can be wonderful, but it can also be confusing and overwhelming. By making the right contacts, you may find that the answers to your problems may be simpler than you think.

QUICK CHECK

Write the name, room number, and phone number of your financial aid counselor.

Internet Exercise

Access the Internet and look up the Web site for your college. If you are not sure how to do this, ask your instructor for help. Locate the following information:

1. Who was the founder of your college or university? What year was it established?

2. What are three curricula in which you could major?

3. Name two instructors who teach at your school (who are not currently teaching your classes). List three interesting things to know about them.

4. Find out what the last date is to withdraw from a class for this semester.

5. Record the library hours for Friday night, Saturday, and Sunday.

Thinking Critically about Study Strategies

CHAPTER 2

Linda Stevens Hjorth

If you have ever explained the plot of a movie, described a recently read book to a friend, or prepared for an upcoming exam, you have participated in the learning process. The acquisition of knowledge—an integral part of the learning process—is achieved primarily through study. Through the mastery of study skills you can begin to control the future course of your education, career, and life.

Study skills mastery is not simply memorization. It is understanding, comprehending, questioning, and learning. Learned information is stored in long-term memory, ready for retrieval when necessary. Your study strategies should allow you to remember vital information and retrieve it in the future.

Studying means taking responsibility for the acquisition of knowledge. Making the most of your study time, focusing as you study, and accepting the responsibility to learn make college victories achievable.

When working through this chapter, choose and practice the study techniques you think will make a difference in your current study efforts. This chapter will strengthen your current study habits whether you are reading, attending lectures, or participating in lab. With the application of each study strategy, your confidence will increase, and you will begin to study more wisely (not necessarily harder) and learn more.

Improve Your Reading Study Strategies with PQ4R

PQ4R is an efficient study technique that was pioneered by Francis P. Robinson (1970) in his work *Effective Study*. It requires you to focus, get involved, and learn. If you are a student who finds himself or herself staring blankly at a reading assignment without comprehension, you can use PQ4R as a way to get started and to maintain interest in reading assignments.

- Preview
- Question
- Read

- Reflect
- Recite
- Review

PQ4R is effective because it provides structure to the study process. When you begin to use PQ4R, you may feel that it takes too much time. Be patient, keep working, and you will begin to experience its benefits. You may even find that some parts of it work better for you than others. For example, the previewing could be helpful, but if you are a visual learner, recitation may not be as informative. Adapt PQ4R according to your learning style.

Let us take a closer look to see how PQ4R can be used to record and remember what you have gleaned from textbooks, notes, and readings.

P—Preview

QUICK CHECK

Choose a chapter that you want to preview. Next, mark the segments as you complete the previewing process.

Table of Contents	_____
Chapter Summary	_____
Vocabulary Lists	_____
Learning Objectives	_____
Headings	_____
Subheadings	_____
Graphs	_____
Charts	_____
Definitions	_____
Words in Bold	_____
Words in Italics	_____

Previewing is a quick way to give yourself a general idea of what the assignment is about. It paves the way for you to gain a concrete overview of information before listening to lectures or reading more comprehensively. Previewing can help you attack information that may seem overwhelming before you begin. It provides you with the fundamentals upon which you can build more detailed knowledge.

To preview, scan each chapter page by page quickly, extracting the essentials while acquiring an initial familiarity with the information. Skim the table of contents and all headings, charts, graphs, definitions, chapter summaries, vocabulary lists, italic or bold words, and learning objectives. Sometimes it helps to read the summary first, to get a general feeling for the chapter, and then to go back and preview. Reading the first and last sentences of each paragraph can also provide the main ideas under each heading. If you estimate that the reading assignment will take an hour, preview for approximately five minutes. (Allow a little more time for material that is especially complex.)

As you preview, ask yourself how this new information relates to your education and your career. Look for items with which you are already familiar and then build upon your knowledge. Examine concepts or ideas that interest you or examine new approaches to old ideas.

Q—Question

While reading, write questions in the margins of the text or on your note paper. One way to do this is to turn headings and subheadings into questions. For example, if a heading in a psychology text reads, "Psychoanalysis: Sigmund Freud," you could ask the question: How does Sigmund Freud relate to psychoanalysis? As you read the assignment, answer the question.

Active questioning correlates to active learning. Asking yourself questions as you read forces you to focus on and understand the information you are reading. If you do not ask questions, you may find that your eyes see words your mind never registers. Thoughtful questions indicate that you are reading, digesting, and integrating the written word. Questioning causes you to be more interested and less distracted.

R—Read

You have previewed and created questions; now it is time to read. Read actively! One goal in your reading might be to answer all of the questions you have created. Pay attention to the words and associate what you are reading with the concepts you already know. Visualize any ideas, pictures, words, or theory that will help you to recall the material. Change the speed at which you are reading based on the diffi-

QUICK CHECK

Record one question you have about this chapter.

QUICK CHECK

Which reading time pattern works best for you?

culty of the material and your understanding of it. You will need to slow down for more difficult materials and pick up speed when you are familiar with the subject. Pause occasionally during your reading time to ask yourself what you have just read. Some reading assignments, because of their complexity, may dictate that you read the chapter more than once.

Time your reading sessions to your needs. It may work to read for thirty to forty-five minutes and then take a ten-minute break as a reward for your effort. Or you may be more comfortable reading in two- or three-hour sessions. Everyone has different concentration rates, so experiment and find the time pattern that works best for you.

Also, try reading at the time of day you focus best. If you can control your schedule, experiment with early morning, lunch-time, or after-dinner sessions. The ones that work best are the ones that you should use routinely.

R—Reflect

Reflection is an integral part of learning that allows you to ponder, contemplate, and rethink what you already know while stretching your mind to integrate new information. After reading a segment of text, put your book down and think about the reading. Allow yourself to be open to any thoughts that come to mind. There can be no time limit or time expectation for reflection, as it depends on the simplicity, complexity, or emotionality of the materials that you are reading.

Reflection solidifies new concepts in your memory through reinforcement. It allows you to look at issues with a new perspective, too. Only through reflecting on reading material can you master it.

R—Recite

Have you ever read an entire page and not remembered one word? The technique of recitation can solve this problem. Rehearsing important points out loud allows you to remember them more easily. Why? Because reciting keeps data in your short-term memory long enough for it to solidify and enter your long-term memory.

Reciting also allows you to use more than one of your senses while studying. Hearing the words through recitation triggers memory, as do sight and touch. That is why writing about your reading, speaking aloud, and following a graph line with your finger as you recite reinforces learning.

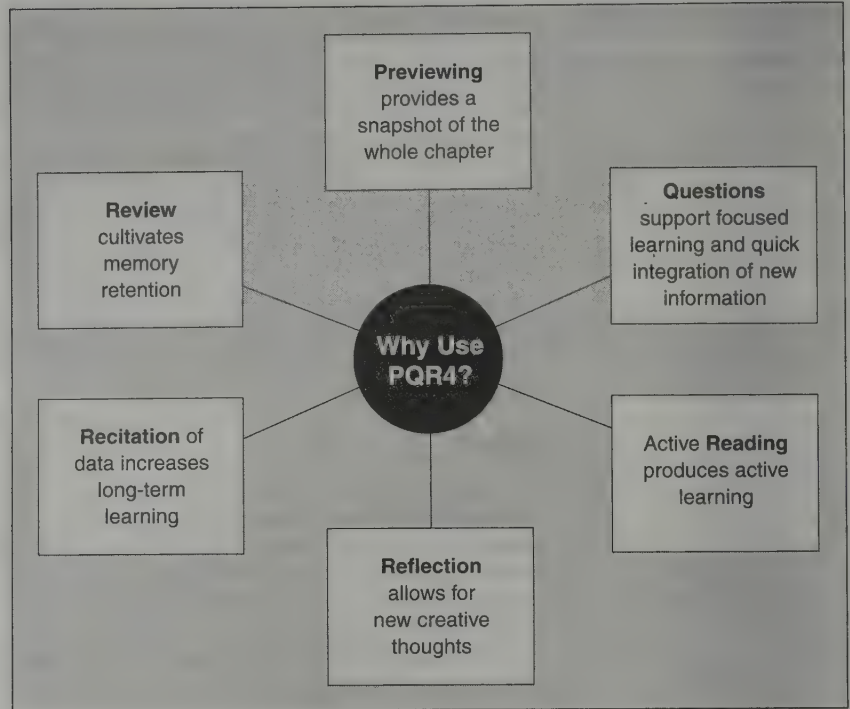
How do you use recitation when you study? Read aloud! Read a paragraph, cover the material you have read with your hand, and then recite the main points that you have learned. Another way is to recite terms, concepts, theories, and new information over and over verbally. The experience of hearing your own words is powerful.

Through recitation you will also challenge yourself to know what words say and mean. Hearing the words forces you to stop and examine them for further meaning: What did I just read? What did it mean? This immediate feedback sharpens your focus, increasing understanding and confidence.

Recitation is also practiced in study groups. Teaching the lesson to other group members and asking or answering questions augment your own learning.

R—Review

Cultivate the reviewing habit. Consistent review of recent readings or new notes reinforces learning, especially when done within twenty-four hours. Daily reviewing, even for fifteen minutes per class, eliminates the need for cramming. It is a simple formula: the more you review, the more you remember.



As you conduct your daily review, skip material that you already know; concentrate on concepts that are difficult, confusing, or difficult to remember. If a concept is not clear, look it up, ask your professor or study group members, or review it until it is understandable.

There are many additional tips that will strengthen your study skills. As you read about them, decide which ones you would like to experiment with. But first try out the PQ4R exercise on pages 00 and 00 to reinforce what you have just learned.

EXERCISE

Practice PQ4R

The purpose of this exercise is to practice PQ4R using a current reading assignment.

1. Choose a chapter that has been assigned in one of your classes. Use the PQ4R method as you begin the reading assignment.
 - a. **Preview** a chapter. List the main concepts that you just learned.

- b. Write down **questions** you have from the reading assignment and then answer them. (The answers could come from the text, your instructor, or your study group.)

- c. List new concepts that you learned from reading.

- d. Pick a topic that lends itself to **reflection**. Write (without censoring) any thoughts that come to mind. How did reflection increase your understanding of this concept?

- e. **Recite** concepts that you would like to learn more comprehensively. Do you find that recitation increases retention and understanding?

- f. **Review.** Describe reviewing techniques that work best for you. Be specific in your description. ("I like to walk around my room, reciting out loud concepts that confuse me.")

2. Which part of PQ4R worked best for you? Which part is least effective? Provide specific examples to support your answer.

3. Which part of PQ4R best matches your learning style? How can you use the information that you learned from this exercise to help you become a more effective learner?

Study Tips

The following helpful hints can assist you in creating the best possible study environment and study habits. The hints are categorized as follows: Master Basic Study Strategies, Control Your Study Environment, Prepare for the Classroom, Find New Ways to Study Math, Study Science More Effectively, and Use a Computer to Support All Study Techniques.

Master Basic Study Strategies

Search for Meaning. Information will not be stored in long-term memory unless you believe it is meaningful. Find ways to create meaning in your assignments. Make sure you know what the information means and how it is relevant to you, and your effort will be rewarded by memory.

Create Interest in Your Subjects. Being interested will enhance your motivation to learn. The more you like what you study, the easier it is to remember. Who wants to remember boring, irrelevant facts? Change your perception and make it interesting.

Learn General Concepts First. Start with major ideas and concepts. Then break them down into smaller pieces to understand them better.

Manage Your Study Time Wisely. Make wise decisions about your use of time. Pull out your time management chart, term calendar, or to-do list to keep you on track. Do not procrastinate. Start working on projects and assignments as soon as they are assigned. Thinking “I will do it tomorrow” only creates stress. Set some interim deadlines to keep yourself on schedule.

Schedule Two Hours of Studying Time for Every Class Hour. This is a formula that you can use to estimate study time weekly. You may find that it works for most classes, or you may find that some classes will take more time and others less. This formula may also change based on the number of tasks that need to be completed and the deadlines attached to each task. Use your priorities as a guide to compute exactly how much time you will need to study each subject.

Study the Hardest Subject First. Finish the most difficult tasks first. You will have more energy at the start of your study session to tackle tough concepts. Fight the desire to procrastinate. Studying the difficult subject first relieves stress; it also makes the easier subjects seem like a reward for working so hard in the first place.

Overlearn. You might find yourself studying enough to pass the test. Do you just want to pass the test? Or do you want to learn the information enough to do more than pass the test? You need to permanently remember and understand information in order to do well in advanced classes and learn the skills essential for your career. “Just passing” may not provide you with those skills.

Instead of memorizing information so that you can regurgitate it later on a test, overlearn for permanent memory storage and retrieval. By asking questions, examining, evaluating, reflecting, and repeatedly relearning information, you can retain more details for tests, for later courses, and for your career.

Know When to Ask for Help. Tutoring is available on your campus; all you have to do is find it. If you feel that you are falling behind in your studies, ask for help now. Most classes build upon the information already presented. Therefore it is important to seek help before you become lost in the material and fear failure.

Create Effective Study Sessions. Figure out the amount of study time that works for you. You might study best with fifty-minute study sessions and ten-minute breaks. Or you might learn best by studying for two hours with thirty-minute breaks. You probably do not want to study five or six hours without a break, unless you become so focused on the writing of a paper or so interested in a reading assignment that you could not quit if you wanted to. Experiment with different time spans until you find one that works best for you. No matter what the length of your study session, the more often you study and review, the more you will learn.

Narrow Down Information. It is frustrating to look at a chapter assignment and feel there is no way you could learn everything. The following suggestions will help you narrow down your reading assignments:

- ▶ Obvious but important: eliminate anything the instructor said should not be studied.
- ▶ After previewing the chapter, go back and correlate your lecture notes to the text. Place a star or check next to any information that was emphasized in class, prioritizing the mass of information. You now know those are the areas that you should study first. Then go back and sift through other tidbits of information that would be useful to know.
- ▶ Try to write down all important concepts on one piece of 8" × 11" paper. If you have prioritized accurately, you now can narrow your focus again.
- ▶ Ask study group members what they feel should be studied and what should be eliminated. Check your assumptions for accuracy, and confirm with your instructor if in doubt.

Be a Kinesthetic Learner (No Head Propping). Learn by doing! If you passively sit in your chair, propping up your head with your hand, do you think you are really learning? When you study, you need to be energetic and burn calories. That does not usually happen with head propping.

Instead, look for active ways to learn and study. Walk or stand as you read; sing out the words. Throw your note cards on the floor. Stand by each one and see what you can remember about the topic before you pick it up.

Write a term on the front of a Post-it note and a definition on the back: then stick each note to a wall. Walk to the wall, look at the term, and state the definition. Look at the back of the note. Was your answer correct? If you had the right answer, take the note off the wall. If your answer was wrong, leave it on the wall to review later. This process is rewarding because you can immediately see what you have learned and how much is left to master.

Review Your Notes Immediately After Class. Review your notes while the ideas are still fresh in your mind. It is easier to transcribe words that are difficult to read or fill in fragmented sentences or incomplete thoughts shortly after the lecture. You may not remember this information three or four days from now. Going over your notes after the lecture helps increase memory retention.

Reviewing notes during breaks between classes is an excellent use of time. Find time to review notes again quickly before class begins. This provides continuity as you listen to the new lecture, and it increases retention.

Study When You Are Energetic. Monitor your energy level. Identify the time of the day when you have the most energy and use it wisely. If you notice that it is easier to concentrate in the morning than at night, you have targeted the best time for you to study. If work schedules or family obligations interfere with your ability to study during your peak times, study as close to the targeted time as possible.

QUICK CHECK

List three study tips that work best for you that are not listed in this chapter.

1. _____

2. _____

3. _____

Stay Focused. Boredom, problems, and daydreaming can all interfere with studying. Find ways to keep yourself focused. Every time your mind wanders, capture your attention and bring it back. Become involved actively in your notes or text instead of focusing passively on your boredom or your personal problems.

If problems divert your attention, write about them. Sometimes jotting down quick notes or reminders on a separate sheet of paper will relieve the anxiety that problems cause, allowing you to quickly refocus on your studies.

If you find that your mind wanders when you start to study, do not despair; it is a common problem. Keep trying; it may take ten or fifteen minutes to get into the study routine.

When you really cannot focus, do study-related tasks. Preview the chapter, rewrite your notes, type key words or definitions on the computer. Actively pursuing related tasks will help you jump into studying quickly.

Visualize Your Lessons. The more you can create mental pictures of information to be learned, the more memorable the data will be. Draw or visualize the lesson. If you can see it, you are more likely to remember it.

Control Your Study Environment

Always Study in the Same Area. Studying in the same place all the time improves your concentration. You will not need to constantly adjust to a new study environment, and the inevitable distractions around your study area will be ones that you are used to, so you can deal with them swiftly or even ignore them. If you find that you tire or your attention wanders, walk away from your study area. That way your mind will associate your study area with focused study only.

Experiment with various study locations. Find out whether your desk, the floor, or a library corner works best for you. Avoid studying in bed; falling asleep will not help you in your learning endeavor, and associating active learning with your bed may disrupt your sleeping habits.

Choose Your Study Area Carefully. Your study environment should be one without distractions. The general rule is no TV, no music, no loud roommates, no ringing phones, and no screaming children. However, the best study environment is a personal choice. You may be able to study only with music on or with your children around you. Experiment. Do not have any qualms, however, about unplugging the phone (or turning on your answering machine), creating mutual study time with your roommates, asking not to be disturbed (hang a sign that says, "Do Not Disturb" or simply say, "I do like you, but I need to study now!"), or creating child-free daily study times.

Choose a Well-Lit Study Area. When you study in an area that has poor lighting, you may experience eye strain, muscle tension, and irritability. The lack of light may cause you physical discomfort and stress. You want focused concentration when you study, and improper lighting is a distraction and a hazard.

Have Supplies Available Before You Begin. Do not let your excuse for not studying be that you need a drink, potato chips, pencils, a dictionary, tape, a calculator, disks, or note cards. It is all too easy to waste twenty minutes running back and forth acquiring supplies. Set up your study area before you start studying.

When you run out of supplies, write them on a shopping list and purchase them ahead of time for your next study session. Do not interrupt your study to go out for things at the last minute.

Prepare for the Classroom

Read Before You Enter the Classroom. Learning starts before the lecture begins. Be sure you have completed the homework and have read the assignment before entering the classroom. Difficult or uninspiring lectures are easier to understand and remember if you know what the instructor is talking about before he or she begins. The assimilation of data takes less effort when you are prepared. Accept responsibility for preparing yourself.

Monitor Your Attention Level. How attentive are you? Learn to focus on the lecture. Control your daydreams and your attention level. When daydreams or problems pull your focus away, bring yourself back and refocus on classroom activities.

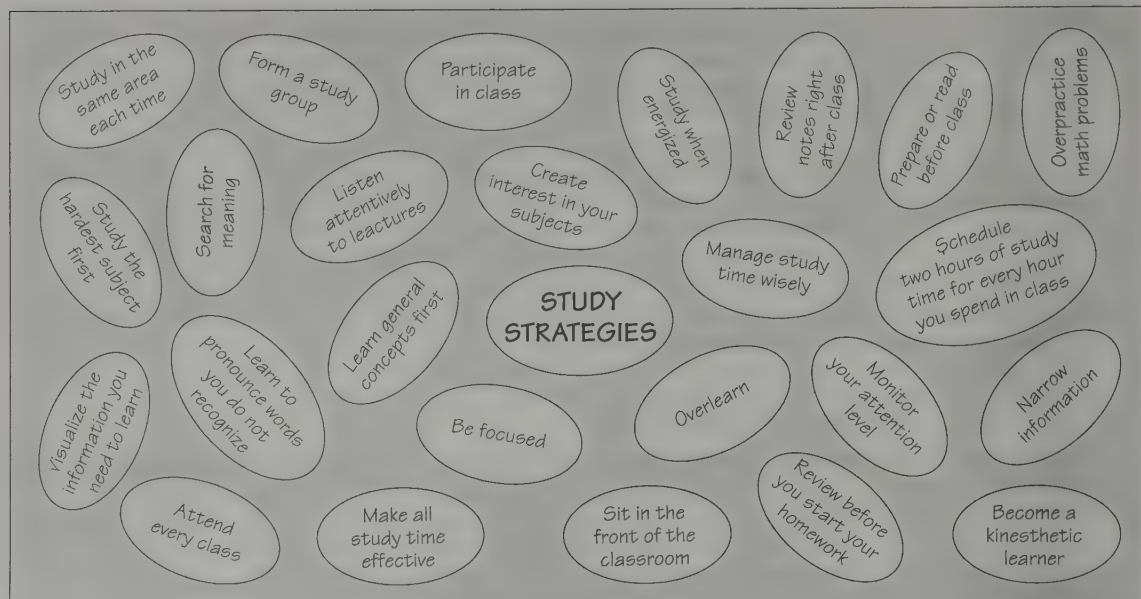
Be There. Do not miss class. Attendance correlates to effective learning and the achievement of high grades. It is hard to know what to study if you are not in class to find out. If you have an emergency and cannot attend, make sure you borrow notes from a reliable friend and record them accurately. If you know ahead of time that you will be absent, ask your instructor what work you will miss and prepare it for next time.

Keep a Positive Attitude. A positive attitude keeps you open to new ideas and alters old perceptions. Coming into class with the attitude “I will learn something today” correlates directly to the amount of energy you will put into learning and how much you will get out of it.

Listen and Participate in Class. Listening and participating are both integral parts of the learning process in the classroom. It is difficult to gather accurate notes if you are not listening effectively. It is advantageous to participate in class. Active participation makes remembering easier. (Some instructors encourage discussion and debates; others will not tolerate them. Know the instructor’s rules.)

Sit in the Front of the Classroom. It is hard to fall asleep in the front row. If you are in the back, there are too many distractions and too much distance between you and the instructor. Choose the front whenever possible.

Make Sure Friends Are a Help, Not a Hindrance. If your friends keep you from being focused on the lecture, let them know that their behavior is not acceptable to you. If they refuse to stop talking in class, sit elsewhere. You are spending a great deal of money and energy to attend school, and you do not want it wasted just because you cannot hear the lecture. Socializing has its own time and place. Good friends will understand and learn quickly not to be distracting.



Expect the Unexpected. Instructors may hurry through the last few minutes of a lecture. Be prepared and stay in your seat until you have recorded everything. Often, tests, projects, or reading assignments are mentioned at the end of class. Ask the instructor not to erase the board until you have recorded everything you need to. If you think you have missed something, ask questions.

Knowing that instructors sometimes ramble, be aware and do not lose interest. The speaker may move quickly back into the lecture, and you might find yourself lost if you have not paid attention. Know that some professors give pop quizzes; be prepared for this by keeping up to date with study and review.

Create Questions. Write down questions that relate to the lecture or reading. For the answers, see your instructor, research class materials, or ask your study group members. Even if you think of questions but do not write them down, thinking of questions will keep you involved and focused on learning.

Find New Ways to Study Math*

Math Is an Entirely Different Animal. In most courses, you are successful because you read the assignments, study, understand the information, and then pass the tests. Math is different because you must prove your knowledge base through application. You not only have to understand the formula, you also must be able to work out *any* problems associated with it.

Math is different because it is linear in format. Each new concept you learn builds on the ones previously learned. If you skip a class and miss the material presented, you may not be able to understand the next lecture. Once you have fallen behind, catching up becomes difficult.

*This section, "Find New Ways to Study Math," is reprinted with permission from *Winning at Math*, by Dr. Paul Nolting, © 1991 Academic Success Press.

To be successful at math, you must understand each new mathematical theory before you can proceed to the next one. This understanding comes from doing your homework, working through problems, and striving to understand the basis of each mathematical step. You cannot walk out the door, forget what you have learned, and hope to be successful on the next test you take.

College-level mathematics courses are more difficult than high school math courses. Instructors teach faster and expect you to learn in one semester what it took you one year to learn in high school. It is your responsibility to keep up and to learn the information as fast as it is being presented. Here are some tips for doing that.

Study with a Partner. One of the best ways to counter math class difficulties is to find a classmate to study with. Your study partner should be someone you can call when you are stuck on a problem and with whom you can schedule regular weekly meetings. This will economize on your study time and may make working through math problems easier and more enjoyable.

QUICK CHECK

Are you currently taking a math or science class? List three ways that you study differently for them than you do for other classes.

1.

2.

3.

Have the Right Skills Before You Begin. If you have chosen a math course that requires an extended mathematics background and you do not have the appropriate skills, reconsider. If you are placed in the wrong prerequisite math course and fail it, you may not pass the next math course. It is usually better to pass a lower-level math course with an A or a B than to make a C or a D and risk the possibility of failing the next math course taken.

Students who have not attended college in ten to fifteen years may find that over time their former math skills, however excellent, have deteriorated. To ensure a good grade on your first math test, you must have the basic skills you had when you finished your last math class. You can refresh these skills by reviewing old math tests or by working through problems in the review sections of similar textbooks. You might want to hire a tutor if you require further assistance. It is imperative not to delay, because waiting will make it harder to catch up. Tutorial support is most effective when begun within the first two weeks of class.

Conquer Math Anxiety. Math anxiety, or the attitude “No matter what, I will never understand math because I hate it,” dooms you to struggle because you are defeating yourself before you even start. Many academic support centers have tutors trained to assist you with math anxiety. In addition, there is software on the market that can create personalized prescriptions for your specific math problems to ensure a higher level of success in your courses.

Review the Text Before Starting Homework. Review all textbook materials that relate to your homework before you begin. This saves you time in the long run. If you are not able to work out a problem, you might have a better chance at remembering the location of a similar problem if you have reviewed already.

Also, review all of your lecture notes that relate to your homework before you begin. If you are not able to follow textbook explanations, use your notes for clarification, or call your study partner.

Complete Homework Neatly. Do your homework as neatly as possible. If you have a question for your instructor, before or after class, he or she will be able to see what your previous attempts at solving the problem were by looking at your work.

Overpractice. Practice problems repeatedly until you are confident in the procedures needed to do the problem and any versions of the problem correctly. In study groups, time each other and see how accurately you can work problems. Notice how long it takes you to complete the problem. The time constraints simulate the classroom testing situation and help you know prior to a test how much time each

problem will take. The more you prepare and practice, the less anxiety you will experience on tests.

Even If You Can Do a Problem in Your Head, Write It Down. Write down every step of the math problem, even when you can do the problem in your head. This may take more time, but the overlearning process will improve your memory and help you on future tests. Doing every step is an easy way to memorize and understand the material, and it also provides you with a complete model of the problem for future study.

Reworking problems you had wrong allows you to identify where you made the error and is well worth the effort. Use a different-colored pen or pencil for corrections.

If you do not understand how to do a problem, use the following steps:

1. Review the test material that relates to the problem.
2. Review the lecture notes that relate to the problem.
3. Review any similar problems, diagrams, examples, or rules that explain the problem.
4. Refer to another math text, math computer program, or math video to obtain a better understanding of the material.
5. Call your study partner.
6. Skip the problem and contact your tutor or math instructor as soon as possible for help.

Understand Before You Proceed. Understanding is more important in math than memorization. Do not memorize how to solve problems; instead, know the reason for each step. When similar problems are presented on a test, you will want to know the rules, laws, or properties that are needed to solve each problem.

Finish with Success. Do not quit or give up. Always finish your homework by successfully completing as many problems as you can. Even if you get stuck, go back and try to complete the assigned problems before quitting. End your homework experience on a positive note. Feel good about your accomplishments.

Write What You Learn. After finishing your math homework, take a moment and write down what you have learned. This information will increase your ability to learn new math concepts. Place the writing in your math notebook, and then quickly review it at the beginning of your next math class.

Do Not Commit Academic Suicide. Do not get behind in class or in your homework. It is academic suicide. If you miss class, or do not practice the problems, you will not be able to understand what the instructor is talking about. Getting behind in math is the fastest way to fail the course.

Study Science More Effectively

Many of the math study tips also apply to science. However, studying science may be a different challenge, depending on your interests and academic background. If you have chosen science as your major, you will probably see these courses as fun and challenging. If you are taking science as credit for graduation and feel like you need a little help, then the following tips are for you.

Choose a Science Course That Fits Your Interests, Experience, and Abilities. Take charge of your education by making smart choices when you plan your semester

schedule. Examine course descriptions and prerequisites in the college catalogue before you enroll. Go to the bookstore and evaluate the assigned textbook so that you know what the course will entail before you begin.

Science courses like astronomy, biology, and earth science emphasize learning information. Chemistry and physics emphasize problem solving. Students who have a strong math background may prefer chemistry or physics. By reflecting on the type of science you like, you can choose a course that is compatible with your experience and interests. If you are currently in a class that you know is too difficult, talk to your advisor to discuss alternatives.

Do Not Let Your Attitude Stop You Before You Start. Choose to have a positive experience in each classroom that you enter. Your image of what science might be is probably different from the reality. When you think of science, do you think of peculiar smells, terms you cannot understand, or professors who look a little different? Let go of your negative perceptions and start fresh. Each time you notice thoughts such as “I do not understand” or “This is confusing,” take charge by reading more slowly, rereading, asking questions, seeking tutoring, or setting up more study-group time. As you learn, doubt and frustration will disappear. Remember, you control your learning by managing your attitude and your studying behaviors.

Learn to Pronounce and Understand Science Terminology. Terms in science may be lengthy, unfamiliar, and difficult to pronounce. They can be daunting when previewing a chapter or even reading one paragraph, yet tests are often based on them. Therefore, it is important to spend extra time slowly reading each paragraph. Break paragraphs into small sections, making sure that you are understanding what you are reading. Science is not a course where you can skim pages and hope to learn information quickly. By correctly pronouncing the terms, correlating terms to definitions, creating note cards, and studying in groups, you can learn science more easily.

Compare and Contrast Graphs, Illustrations, and Appendixes to Your Reading. Reading alone may not be enough. Use graphs and illustrations to complement your reading. Be sure to spend extra time understanding graphs and illustrations because they often make concepts clearer than words. The idea that a picture is worth a thousand words is especially true for science. Graphs and illustrations may be easier to recall than specific terms.

Appendixes in your text support lectures and readings. They often provide chapter summaries, answers for end-of-chapter quizzes, classifications and tables, or additional graphs or techniques that support your current learning strategies.

Make the Most of Science Labs. The classroom and reading assignments provide theoretical scientific knowledge. The labs allow you to practice what you have learned from lectures or readings. Always try to understand the relationship between lectures, readings, and lab assignments.

Resist the urge to skip lab and do it later. The time you miss from labs can be difficult to make up and may cause you to lag behind in handing in homework or understanding the application of theory.

Ask questions before you start the lab. Make sure you know what the purpose of the experiment is and what procedures you should follow before you begin.

Write an outline of your lab reports in an organized, neat format before you leave the room. If you wait until you go home, you might forget important, specific points that should be included. If your notes are messy or difficult to read, you may not be able to interpret them. Always proofread and reread lab assignments before handing them in.

Use a Computer to Support All Study Techniques

Your computer can increase your organizational ability and improve your capacity to learn. You can store information, create your own study guides, type study questions, compose an analysis of information you have already learned, and use CD-ROM study aids to enhance and support your current study strategies.

Store Data. By storing significant information on files in your computer, you will save time and be more organized. With the dates for significant projects or exams recorded on your computer-generated calendar, you will have easy access without having to remember where you put your daily calendar. You can even scan handouts from instructors to keep in easily accessible files for retrieval. Use your computer to store any information relevant to your study sessions.

Create Study Guides. After reading an assignment or listening to a lecture, you can create your own study guide of terms, definitions, and formulas that will support your study efforts.

Create Practice Tests. Practice tests are a good way to study. Whether alone or in a study group, after reading your assignment or studying your notes, create a computer-generated test. Include questions and problems in different formats (e.g., true-false and fill-in-the-blanks) and be sure your test covers all of the material for which you are responsible. By using computer graphics, different fonts, italics, and bold, your review process becomes easier and more fun.

QUICK CHECK

List three Internet addresses that correlate with the courses you are taking now.

1.

2.

3.

Type to Learn. After studying, sit at your computer, pick a topic, and type anything about it that comes to mind. Through free-writing, you can assess how much you know and how much you still need to learn while simultaneously reviewing each topic.

Use Educational CDs. Educational games are available that will reinforce concepts and offer an opportunity for fun. You can work at your own pace and choose your level of learning

Surf the Internet. When you are stuck and cannot find the answer to a question, access the Internet, where there are hundreds of thousands of accessible resources. Cruising the Net is an enjoyable way to enhance and reinforce your studies. Be aware, however, that some Web sites are more credible than others. When reading information from the Internet, do not forget to use your critical thinking and problem-solving skills to assess its accuracy. If you choose a site from a nationally known organization or publishing company, you can be more confident of the accuracy of the information. When in doubt, ask your instructor.

EXERCISE

Practice Study Strategies

The purpose of this exercise is to integrate and practice various study strategies.

- What study strategies do you use currently that are not mentioned in this chapter? Why do these strategies work for you?
 -
 -
 -
- List three new study strategies discussed in this chapter that you will use. Try them for three consecutive study sessions and then write about their strengths and weaknesses.
 -
 -
 -
- Find a graph or illustration in one of your current textbooks. Copy it and attach it to this exercise. Explain in your own words what the graph or illustration is trying to explain, what you learned from this graph or illustration, and how this graph or illustration enhances your understanding of the information presented in the text.
 -
 -
 -

Memory

QUICK CHECK

Think of a lecture that you attended last week. On a separate sheet of paper, write down everything you remember from it. Now reread your notes from that lecture. What percentage of information could you remember?

Studying daily, reviewing, and using PQ4R are some of the best ways to learn. Because studying is not simply memorizing, your method of learning should allow you to understand information. If an idea or concept is to be stored in long-term memory, it must be imprinted intensely in your mind. If imprinting does not occur, forgetting may be the thief of your hard work.

In an experiment, people were asked to read a textbook chapter and then were asked how much they remembered. The respondents forgot 46 percent of the material within one day, 79 percent after fourteen days, and 81 percent after twenty-one days (Pauk 1997).

Reading seems to promote memory retrieval more easily than the spoken word. If you read, you can recite, stop, reflect, and read again. If the words are spoken, it is harder to recapture them. This concept was exemplified by an experiment done at the Cambridge Psychological Society. Researchers secretly recorded a seminar in which the members had participated. Two weeks later, the members in attendance were asked to write down what they remembered. They could not accurately recall more than 10 percent of the points that had been presented in the lecture. Much of what participants remembered was different from what was actually presented, and in fact, incidents were remembered that had never occurred. Casual remarks were exaggerated, and specific pieces of information were reported that had been alluded to only (Pauk, 1997; Hunter, 1957).

The Curve of Forgetting

Hermann Ebbinghaus (1850–1909) was a pioneer in the study of human memory. One result of his research was the curve of forgetting: the longer the time lapse after learning information, the harder it is to retrieve the information. He discovered that our memory for learned information is best directly after a learning session. He found this by presenting a list of nonsense syllables (e.g., *dod, gid, eoe*) to his only research subject, himself. He used nonsense syllables because they were meaningless and seemingly would be more difficult to remember. He was hopeful that he could identify a “pure” memory that was not tainted with meaning or compounded by earlier learning (Davis and Palladino, 1994).

Ebbinghaus’s studies have been supported by further research, including that of Jenkins and Dallenbach (1924), who discovered that memory loss correlates directly with the amount of time elapsed. This theory is further reinforced by the Curve of Forgetting figure by Atkinson and Longman. More than 50 percent of information is forgotten after 1 hour and 70 percent is lost after 48 hours. (Davis and Palladino, 1994; Jenkins and Dallenbach, 1924; Curran and Keele, 1993).

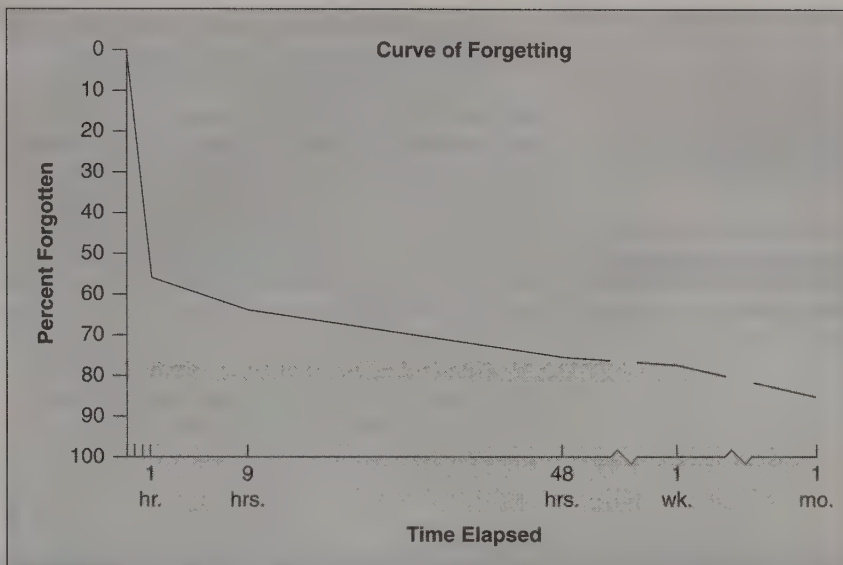
The research illustrates that with the passage of time human beings forget things. This is why some students proclaim that cramming works. They cram as much information as possible into their brains prior to an exam, regurgitate the information, then leave the room, and forget most of it. The goal of learning is to store information relatively permanently, not simply for tests. Cramming stores information only for a very short period of time. Since you are in college to learn information for your career and your life, cramming seems to defeat your purpose.

In order not to forget, you must make an effort to remember. Repeated study sessions, visualization of concepts, and overlearning fight forgetfulness.

Mnemonic Devices

MNEMONICS are simple associations, rhymes, or aids used in remembering.

Mnemonics are simple associations, rhymes, or aids used to prompt memories. When you want to remember something, by using a mnemonic you send a recognizable cue to your memory bank that in effect calls up or prompts the needed information. Mnemonics force you to associate what you are trying to remember with what you know already.



Source: Reprinted by permission from Atkinson, R.H., and Longman, D.G., *Reading Enhancement and Development*, Third Edition. © 1990 West Publishing Company.

If you have a great deal of information to learn quickly, mnemonic devices can serve as a memory retrieval cue, but they should not be used as a substitute for learning and understanding. Before you create and use mnemonics, be aware that it can take more energy to create and remember the mnemonic than it does to learn the original concept. Be sure to put mnemonic devices into perspective and realize that memorization without understanding is superficial. Examples of mnemonics are coding, acronyms, and acrostics.

CODING changes information in ways that make it more memorable.

Coding. Information that is not meaningful or relevant to the learner is hard to remember. Coding makes information more memorable by translating it into a more meaningful form. If you had to remember BIR, WOC, and MIR, it could be difficult because they lack meaning. For easier memory retrieval, you could code them in reverse. Then BIR becomes RIB, WOC becomes COW, and MIR becomes RIM, which are familiar and easy to recall.

An ACRONYM uses the first letter of key words to encourage memory retrieval.

Acronyms. An acronym is a word or group of words created by using the first letters of key words to help you remember a concept—for example, MADD (Mothers Against Drunk Driving) or, in psychology, GAS (General Adaptation Syndrome, a theory that discusses an individual's ability to adapt to stress), or HOMES (a way to remember the five great lakes: Lake Huron, Lake Ontario, Lake Michigan, Lake Erie, and Lake Superior). Practice memorizing the acronym and then reciting what each individual letter represents to prevent confusion and memory loss at test time.

An ACROSTIC is a sentence or phrase built from the first letters of key words.

Acrostics. Acrostics are sentences or phrases built from the first letters of key words. If you are learning a concept that must be remembered in a specific order, acrostics work. Acrostics use the letters of the key words to form a sentence. What is the sentence "Every good boy does fine" an acrostic for? Every Good Boy Does Fine is familiar to many piano students as the way to remember the lines of the treble clef: E, G, B, D, and F. The sentence "Please Excuse My Dear Aunt Sally" helps students to remember that the order of math operations is the following: Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction. To learn the angle of a triangle, use SOH-CAH-TOA, which will help you remember Sine = Opposite over Hypotenuse, Cosine = Adjacent over Hypotenuse, and Tangent = Opposite

ASSOCIATION is connecting a concept you are trying to learn with a memory that is already established.

QUICK CHECK

Which memory trigger works best for you?

over Adjacent. By reciting an acrostic and thinking about it, the concept will be stored in your long-term memory more easily.

Association. Associating a concept that you are trying to learn with a memory that is already established is a quick way to remember information. The association of “lefty—loosey; righty—tighty” when you are trying to turn on a water faucet can prevent confusion or frustration. Names are difficult to remember. The more you can associate a name with a picture, rhyme, song, or image of someone with the same name, the easier it will be to recall the name when you see the person again. For example, if you meet Robyn for the first time, you could start singing the song lyrics “Rockin’ Robin, tweet, tweet. . .,” and if nothing else, the embarrassment would help you recall her name the next time you see her.

When other forms of study cannot help you retrieve information from memory, mnemonics can provide easy memory triggers. They do not take the place of learning or understanding, but they do provide helpful ways to remember.

EXERCISE

Memory Triggers

The purpose of this exercise is to practice using memory triggers as a study technique.

1. Work in groups of four and list examples of coding, acronyms, acrostics, and association that are not in this chapter. You may need to research this further on the Internet or at the library.

a. Coding:

b. Acronyms:

c. Acrostics:

d. Association:

2. Which technique was the most effective? The least effective? Why?

Step Inside . . . The Academic Support Center

The Academic Support Center, the office that provides academic support to students, may be called the Academic Resource Center, the Student Accessibility Center, the Teaching Learning Center (TLC), or the Learning Skills Center. Whatever the name, all college campuses provide support to their students in offices manned by tutors, volunteers, professors, or professionals. These people are trained in diagnosing and helping students with learning or other disabilities; helping students who are learning English as a second language; tutoring; teaching study strategies; and answering academic questions.

The Academic Support Center conducts tutoring and minilectures on most subjects taught at your college. When you become frustrated with your studies, instead of giving up or yelling at the dog, contact the support center. Many have walk-in tutoring, while others require appointments. Some students visit the center biweekly or more often to increase their understanding of specific subjects. It is free of charge, and its sole purpose is to help students become successful as they meet various academic challenges. If, for example, you walk out of a math class and feel confused or frustrated by the lecture, you can walk right into the academic support center and set up an appointment for tutoring so that you can alleviate your frustration and improve your confidence that you do know how to work out the problems.

Some academic support centers have hotline phone numbers so they can answer your questions twelve to eighteen hours per day. Other centers provide online service so that you can receive help from the comfort of your own home via your computer.

Internet Exercise

Look up study skills on the Internet and find two Web sites that describe study strategies. The links may be connected to topics such as effective study skills, the ten best study skills, study traps, successful learning, using the Academic Skills Center, and so on. List the address, author, title, and summary of each site:

1. Web site address:

Webmaster/author:

Title:

Summary/description:

2. Web site address:

Webmaster/author:

Title:

Summary/description:

Test-Taking

Tests are tools used by instructors to measure students' retained knowledge in specific academic areas. But tests are more than that to students. Tests represent the ability to remember and transport information into various formats. Whether your instructor lectures, shows a movie, or orchestrates small-group activities, it remains important to remember what you learned in each situation. You may be asked to transform that information into speeches, essays, and multiple-choice tests later on. Figuring out the complexities of the testing scenario remains a constant challenge. That is why each test that you do well on, each grade you achieve, each piece of information you remember, and each theory you understand becomes a victory in college. Not only that, but the skills you use in test-taking are the same skills that you will use in your career search and on the job. Each time you learn material for a test,

you are also learning for your career. The information learned in college is the foundation of the stored information that you will need to know for life.

Tests measure the number of questions that you answer correctly and what you are able to remember, and illustrate your ability to understand. Tests also force you to learn concepts, theories, definitions, formulas, and ideas by deadlines. What tests do not measure is intelligence, and they usually do not measure creativity or who is the smartest in the class.

Some students like tests and perceive them as a challenge. Tests are a way to show themselves and the instructor that they have mastered new ideas and information. Other students may have an intense dislike for tests and experience anxiety as soon as they are handed one. They can learn to counter their distaste for tests by reviewing and studying smarter.

Put tests into perspective. Tests need to be seen as a way to learn, not as something to pass or fail. An F on a test means that it is time to reevaluate your study and test-taking strategies. Do not let low grades discourage you. Instead, change your behavior. Give yourself control over tests by learning new test-taking strategies so that you can study more effectively.

Test-taking requires preparation and dedication. This chapter will help you to increase your ability to prepare for quizzes, tests, and final exams by learning various test-taking strategies.

Preparing for Tests

There are many ways to prepare for tests: the tried and true ones that you have always used, as well as new ones. As you prepare for tests, incorporate the following suggestions into your test-taking strategies.

Before the Test

Create Practice Questions

- ▶ As you study, create and write out your own test questions.
- ▶ When creating questions, see if you can second-guess the instructor. Try to predict questions that the instructor might ask.
- ▶ Put the questions on 3" × 5" cards and use them as a study guide.
- ▶ On a daily basis, see how many questions you can answer. Look up those you do not remember.
- ▶ Study through the pile of cards you have. When you know the answer, take that card from the pile and place it in an "Already-Know" pile. Keep working through the "Do Not Know" pile until you learn the information on every card.
- ▶ Once you have worked through all of the cards, take out the entire Already-Know pile again and see how many you still remember.
- ▶ Continue a daily review until the exam.
- ▶ Review the Already-Know pile the night before the exam.

Review Notes Daily

- ▶ If you study your notes daily, you will be prepared for the test. You will be able to walk into the test rested, relaxed, confident, and unstressed because you were not up the night before cramming.
- ▶ Rehearsal of information on a daily basis allows information to transfer from short-term memory to permanent storage in long-term memory.

- ▶ Use study groups as a fun way to review and learn.
- ▶ As you study, create memory strategies and visual images to increase information retention.
- ▶ Concepts that have been consistently reviewed and stored in your long-term memory are much easier to retrieve. Review your notes as soon as possible after completing them.

CRAMMING is forcing too much information into a tired brain in a short amount of time.

Get a Good Night's Sleep

- ▶ Studying instead of sleeping is not sensible. Lack of sleep interferes with your ability to focus on questions or readily retrieve information from memory. Remember, cramming is forcing too much information into a tired brain in a short time.
- ▶ If you have reviewed consistently and studied all of the assigned readings and notes, you will not need to stay up all night studying.
- ▶ If you feel you are not prepared for the test, you will need to make a judgment call. Would you be better off studying for two or three hours and then sleeping? Would you be better off sleeping and relying on what you already know? The decision is your responsibility, but think it through very carefully before you exhaust yourself in the name of studying.

Exercise

- ▶ Walk, run, hop, skip, or jump.
- ▶ Exercise before you enter a classroom for a test. When your circulation is moving, you will be more alert and focused as you answer test questions.
- ▶ Exercise enhances an overall good feeling. This good feeling allows you to feel more confident as you complete the test.

During the Test

What Works Best for You in Test-Taking Situations?

QUICK CHECK

How would you describe your test-taking style in ten words or fewer?

- ▶ Do you like to sit calmly and wait for the test, with your books put away and pen or pencil out?
- ▶ Do you like to do a last-minute review of notes before a test? (Some students who have short attention spans report that reviewing quickly before a test is helpful. Others say that reviewing right before an exam is confusing.)
- ▶ Pay attention to your own test-taking style. Use techniques that are effective for you.

You Are in Control of the Test; the Test Does Not Control You

- ▶ Monitor your thoughts while taking the test; keep them positive and focused.
- ▶ Relax. Take a deep breath; let your muscles relax; then refocus on the test. This simple process forces anxiety to dissipate while regenerating memories that will supply you with the knowledge needed to do well on the test.

Scan the Test

- ▶ When you receive the test, make sure that all of the pages are there. Sometimes pages are missing. Instructors may not be sympathetic if you have not answered

all of the questions because of a missing page. They may feel it is your personal responsibility to know how many pages there are on the test.

- Look to see how many questions are on the test. This may help you gauge your time more wisely.
- After you scan the test, start with the questions that you know best.
- When scanning questions, you may find memory cues in the other questions that trigger an answer you could not remember. You might even find that an earlier question is answered by a later question.
- Another scanning technique is to mark the questions you do not know and go back to them later. Otherwise, you may waste time on the ones you do not know and not have enough time to answer the ones you do know.

Visualize Yourself Being Successful

- Remember the notion that positive thinking brings positive results. Focus on what you know. The more you focus on what you do not know, the more anxious you will become and the less you will be able to remember.
- Visualize a picture of yourself being confident, feeling comfortable, and knowing the answers. This visualization can increase memory as it reduces anxiety.

After the Test

Ask questions! If You Do Not Understand, Ask Again!

After completing the test, find answers to questions that puzzled you or of which you were unsure. This immediate reinforcement of learning correct answers will help you understand the correlation between your studies and the instructor’s testing style.

HOW SHOULD YOU PREPARE FOR TESTS?		
BEFORE THE TEST	DURING THE TEST	AFTER THE TEST
Preview chapters before you study. Find and create visual clues to trigger memory. Review often. Create practice tests. Use 3" x 5" cards for test preparation. Avoid cramming. Overlearn to prevent test anxiety and frustration. Ask questions to gain insight and understanding.	Pay attention to your test-taking style. Scan the test. Start by answering the questions you know first. Mark the ones that you do not know and go back to them. Stay focused. If you become frustrated or anxious, turn the test over, relax, refocus, and try again. Find ways to make a testing situation a positive challenge.	Seek correct answers to questions that were puzzling or confusing. Clarify and understand mistakes. Pay attention and note correct answers when the instructor reviews the test. Find ways to turn low grades into high ones. If tests become problematic, review Chapter 4, and seek help from support service in your college.

- ▶ Talk to classmates about their answers on the test. The more you discuss test information, the easier the concepts will be to remember for the midterm or final. Be sure to accept other students' answers as correct only after verifying the right answer through the text or with the instructor.
- ▶ Seek out the correct answers and make sure you understand your mistakes. If you are still confused, ask the instructor.
- ▶ Ask questions; ask questions; ask questions! The more you ask, the more you learn and understand.
- ▶ Take responsibility for finding ways to change low grades to higher ones. Use the test-taking suggestions from this chapter to seek solutions to, not excuses for, grades that you do not like.

Preparing for Specific Testing Formats

Be sure to ask instructors what type of test they will be administering. By knowing ahead of time if a test will be essay, fill-in-the-blank, multiple-choice, or true-false, you will be more prepared. As the next paragraphs illustrate, preparation for different test formats requires different approaches and study strategies.

Essay Tests

Before Taking an Essay Test

- ▶ Find out how many questions will be on the test and how much time will be available to complete the test.
- ▶ Study and understand all major concepts. Pay special attention to details that will support the major ideas in your essays.
- ▶ Learn how to spell relevant terms and the names of relevant people.
- ▶ If you were the instructor, what questions would you ask? Create essay questions that you think could be on the test. Practice writing the answers. The more you practice, the more confident you will be at test time.

While Taking an Essay Test

- ▶ Bring an erasable pen to the test. Instructors want to see neatness in your essay tests, not inky, messy blobs.
- ▶ Before you begin writing, look over the test and note how many questions there are. Pay attention to the points attached to each question, so that you spend the most time on the questions with the most points.
- ▶ Do not let questions you do not know upset you or make you feel insecure about your knowledge base. Start with an easy question first to build confidence.
- ▶ If you do not know an answer, start an outline that relates to the question. If an outline fails to bring about an appropriate answer, try a diagram or flowchart. You may find that you know more than you think as you use these test-taking strategies.
- ▶ Be sure that the first paragraph contains the main answer to the question. Then provide support and explanation throughout the rest of the essay. Include any information that you feel is relevant, especially concepts that the instructor has emphasized in class.

- ▶ Pay attention to words in the test question that help you understand the instructor's expectations, and reuse these words in your response. For example, if a psychology test says, "List and explain two characteristics of the Type A personality," an answer might be, "Two characteristics of the Type A personality are as follows: (1) Polyphasic behavior. Type A personalities believe that they must do many things at once. For example, they might put on makeup, drink coffee, and talk on the phone while driving. (2) Walk fast. Type A personalities believe that time should never be wasted. They often walk fast so they can quickly move on to the next task" (Friedman and Booth-Kewley, 1987).
- ▶ Watch the time carefully! The most common mistake made when taking essay tests is spending too much time on one question and not being able to finish others.

Helpful Hints for Essays

- ▶ Write next to each question the amount of time you think you will need to effectively complete the essay. Then manage your time accordingly. Be sure to wear a watch, or use the classroom clock to guarantee sticking with your schedule.
- ▶ Remember that instructors want you to recall information, examples, dates, and facts in a format that is in full sentences, organized, and understandable. Use transitions that help the instructor follow your train of thought from paragraph to paragraph.
- ▶ Read the question several times. Make sure that your writing relates directly to the stated question.
- ▶ Write on one side of the paper only. The ink bleeds through if you use both sides and makes the paper messy and difficult to read.
- ▶ Some instructors want you to skip a line as you write. It makes it easier for them to read. Write legibly. You want to know that what you write can be read by the instructor without frustration.
- ▶ Finish the essay with a summary that tells the reader the main points of the writing while tying those points back into the original question.
- ▶ Try to leave a few minutes at the end to check for spelling and grammatical errors. Also check the organization of your essay to make sure that the content makes sense.

QUICK CHECK

What are three of the "most helpful" hints for taking essay tests?

1. _____

2. _____

3. _____

WORDS COMMONLY USED IN ESSAY QUESTIONS

BY UNDERSTANDING THE MEANING OF THESE WORDS, YOU WILL BE ABLE TO ANSWER QUESTIONS PROPERLY.

ANALYZE:	To separate into parts and explain.
COMPARE:	To evaluate so that you can find similarities and differences.
CONTRAST:	To find differences between two or more things that are compared.
DEFINE:	To describe exactly; to state the characteristics or meaning.
DISCUSS:	To provide opinions on a course of action or an issue.
ENUMERATE:	To name one by one in a specific list.
EVALUATE:	To find the value or worth.
EXPLAIN:	To provide meaning or interpretation; to state reasons for better understanding.
INTERPRET:	To make meaning clear with new or different words.
LIST:	A series of words, names, or numbers, often presented in order.
OUTLINE:	A systematic listing of major and minor ideas or concepts.

EXERCISE

Taking Essay Tests

The purpose of this exercise is to provide practice in writing essay tests.

Choose a topic that you are currently learning about in your classes and create an essay question. Answer it to the best of your ability without the use of texts or notes. Then find a partner and critique each other's work.

1. *Topic:*

2. *Essay:*

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

- ### 3. Peer Critique:

Fill-in-the-Blank Tests

Before Taking a Fill-in-the-Blank Test

ROTE MEMORY is mechanical memorization.

- ▶ Remember that this type of test is based often on rote memory, which is mechanical memorization. This means that you must rehearse the concepts until they are stored in your long-term memory. The more you rehearse, the easier the retrieval of information will be on the test.
- ▶ Review; review; review. Concentrate on reviewing, because your answers will be based on total recall. You will not be able to use associations as you do with multiple-choice questions.
- ▶ A great tool for fill-in-the-blanks tests is 3" × 5" cards. Write the term on the front and the definition on the back.
- ▶ You are studying specific concepts, not general ones. Look for terms or concepts that you think the instructor could turn into fill-in-the-blank questions. Create your own tests and practice them until you understand the concepts.
- ▶ Choose specific review times and place them in your calendar. Make sure that you follow through. This type of structured, organized studying will pay off.

While Taking a Fill-in-the-Blank Test

- ▶ Before answering any of the questions, read each question carefully. Some terms are similar and can be confused easily.
- ▶ First, answer the ones that you are 100 percent sure are correct. Then go back and answer the rest. Make guesses only if the instructor states that there is no penalty for guessing.

Multiple-Choice Tests

Before Taking a Multiple Choice Test

- ▶ Find out how many questions will be on the test. This will help you understand how focused or general your studying should be. If there are only ten questions, and the grading scale is 100 percent, each question will be worth ten points; thus, your study must be focused on specific content areas. If there are fifty questions, the point value for each question will be much less, and your studying may need to be more general.
- ▶ The instructor's expectations could be different for each test. Be sure to ask questions that clarify the instructor's intentions, and study accordingly.
- ▶ Study to remember associations. The fact that you can choose from several options in multiple-choice tests allows you the freedom to choose answers that are associated most closely with the right answer.

While Taking a Multiple-Choice Test

- ▶ A frequent mistake is not paying attention to directions. For example, before you start the test, you need to know if any question has two answers. You also want to know if you will be penalized for guessing. The answer to these concerns would be in the written or oral directions. If you are not sure, ask.
- ▶ Pay attention to associations. The memory cues are in front of you on the test. Think about each answer and then associate the possible option with what you know is the right answer.

- ▶ Some multiple-choice questions are created so that you will have to apply learned information to get the right answer. They are not all based on mechanical memorization.
- ▶ Do not spend too much time on questions that confuse you. Leave them and come back to them later.
- ▶ Look for terms like *none*, *always*, *never*, *all*, *sometimes*, *usually*, and *seldom*. One of these words can change the whole meaning of the question. When you see one of these terms, read the question carefully because they can be misleading.
- ▶ Negative words can be confusing. Words like *no*, *negative*, or *not* can change the meaning of the question.
- ▶ If it is a Scantron test, check it at least twice before you hand it in. Make sure that you have placed your answers in the appropriate boxes. It is easy to look at the number on the Scantron form incorrectly and consequently make mistakes throughout the test.
- ▶ If you make a mistake on a Scantron form and have to erase, be sure to leave no marks on the form that the machine might misread. You may want to check with your instructor, as some have policies about Scantron erasing (e.g., if you erase, you must ask for a new Scantron form, or if you erase, the instructor may want to make note of erasures).
- ▶ When reading the answers for the multiple-choice question, you may find that none of the options presented seems correct. It is important to read the question again to see if you know the answer; if you do, then look for it in the options. If you do not know the answer, and you will not be penalized for guessing, then go ahead and give it your best guess. You will probably pick up points by guessing answers that you would otherwise miss completely.
- ▶ A common mistake made on multiple-choice tests is not reading through the complete question or all possible options.

True-False Tests

Before Taking a True-False Test

QUICK CHECK

List three of your best test-taking strategies.

1.

2.

3.

- ▶ Go through all materials that you need to learn, and focus on concepts that you feel could be turned easily into true-false questions. Create practice true-false questions and answer them repeatedly until you get them right!
- ▶ The more you study and feel comfortable with your learning, the easier the questions will become.

While Taking a True-False Test

- ▶ Know that in order to mark a true-false question true, the whole statement must be 100 percent true. One wrong word can make the entire statement false.
- ▶ When you read a question with *always*, *only*, or *never*, the answer is often false. It is seldom that things always or never happen; instead, they seem to occur somewhere in the middle.
- ▶ When you read a question with *sometimes*, *often*, or *frequently*, the answer may be true.
- ▶ If you are not sure about an answer, before you guess, go through the entire test, as you might find that another question answers the one that has you puzzled.
- ▶ If you are not sure that you should guess on true-false questions, heed the advice of Walter Pauk, author of *How to Study in College*, Fifth Edition (1994).

Although you have a 50-50 chance of answering a single true-false statement correctly, the odds are not that high for the entire test. In fact, your chances of guessing correctly on every statement decreases geometrically. In a ten-question test, the odds on guessing are against you by more than a thousand to one. If you're unsure of whether to mark "T" or "F" and you're forced to guess, because you are stumped or pressed for time, the odds are in your favor if you choose true over false.

Open-Book Tests

Before Taking an Open-Book Test

- ▶ Organize your notebook and text for easy retrieval of information.
- ▶ Write page numbers on your notes. Create a one-page outline and list the topics that you will need to locate quickly. Specify page numbers (notes and text) next to each related topic.
- ▶ Place paper clips or Post-it notes on your text for quick retrieval of information. You could color coordinate the Post-its with a similar color of ink on your outline. This will help you remember where specific information can be found without wasting time searching for it.

While Taking an Open-Book Test

- ▶ Time management and organization are the key to success. Go through the test and quickly create a time plan. Allow enough time to complete the test, to review what you wrote, and to revise.
- ▶ Answer the questions that you know best, first.
- ▶ If you cannot find information on a specific topic, come back to it later.
- ▶ Do not allow yourself to waste time looking for answers on low-point questions when a larger-point question might have information readily available.

Take-Home Tests

You may use the concepts related to open-book tests if you have a take-home test. Do not make the mistake of thinking a take-home test is a "freebie." Take-home tests are designed to be comprehensive, and an excellent grasp of the material is a must. The more you have organized yourself, your text, and your study materials, just as you would for an in-class open-book test, the easier your take-home test will be. Be sure to use a word processor so that the paper you hand in is neat and organized.

Give yourself the luxury of a quiet place to take this test, where you will be free from interruptions and temptations that may distract you (for example, the radio, the TV, the children, and the refrigerator).

Studying for Final Exams

Final exams are the culmination of what you have been working toward all semester. By starting your semester knowing that daily you are reviewing for the final, you will eliminate the need to cram the night before your big exam.

Finals evoke positive and negative feelings. You feel positive because you are at the end of the term and are successfully completing it. Feelings could be negative because the final might represent 35 or 45 percent of your total grade, causing self-doubts or fear. If you have used the study techniques you learned in Chapter 4 and in this chapter, you will not need to be fearful of finals.

Another way to feel more comfortable before a final exam is to try to find out from your instructor the general and specific guidelines for the materials that will be covered on the final exam. Which chapters, movies, lectures, notes, concepts, formulas, or theories will be on the final exam? Some instructors provide final exam study guides. By getting these early and working with them often, you will be better prepared for finals.

Go over the tests, quizzes, notes, and note cards that you have taken or recorded throughout the semester. These are great review materials as you prepare for the final exam. Review your notes from the text, movies, presentations, or class discussions.

Final exams can be difficult. You may have as many as two or three in one day. Time management and consistent reviewing are necessary when preparing for these important tests. Do not let your final exams scare you. Remember that you control your reaction to your tests. Make final exams a challenge and a victory, not a fearful experience.

Strategies to Combat Test Anxiety

QUICK CHECK

List three ways that you deal with text anxiety.

1.

2.

3.

For some students, test anxiety is a troublesome barrier to achieving good grades. Just by thinking that each grade must be high, you are focusing on performance rather than on learning. Though positive goal setting is good, experiencing test anxiety is proof that you are placing too much attention on performance and not enough on understanding.

Test anxiety may cause you to forget the information that you studied or cause you to feel faint, dizzy, or lightheaded. There are many ways to deal with test anxiety.

Think Positively

Some concern helps motivate you to prepare for tests appropriately. But excessive concern breeds anxiety, and anxiety can halt or prevent effective test performance. So study hard, visualize yourself being successful, and then think positively and confidently as you work on your test. Acknowledge self-fulfilling prophecies. If you *think* you will do well, chances are you will.

Reduce Anxiety Through Preparedness

Walk into tests so prepared that you will have no reason to feel anxious.

Change Perceptions That Cause Fear and Anxiety

When you have physical symptoms of anxiety, it is because you perceive tests as harmful. Remind yourself that you are taking control of the test and have nothing to fear. Then face your fears. Why do tests cause you anxiety? After you answer this question, take a few deep breaths, relax, and strive to put your fears into a positive perspective. This process often causes fears to dissipate.

Source: Adapted from "Humbling Cases for Career Counselors" by Dr. Milton E. Lareson from *Phi Delta Kappa*, February, 1973 Issue, Volume LIV, No. 6, p. 374. © 1973.

THOSE WHO FAILED BUT REALLY DID NOT

ALBERT EINSTEIN was thought to be mentally challenged. He spoke falteringly, until he was nine. One teacher suggested that he drop out of school.

SIR ISAAC NEWTON was a poor student. His parents permitted him to go to school because he failed at running the family farm.

PABLO PICASSO was removed from school at ten years of age because he was doing poorly in school.

R. BUCKMINSTER FULLER built his geodesic domes by starting with an intentionally failed dome and making it stronger and better through learning from mistakes.

WHAT DOES AN F MEAN?

If **F** MEANS **FAILURE TO YOU**, THEN YOU MUST CONFRONT THAT PERCEPTION AND CREATE NEW ONES, FOR EXAMPLE, **F** COULD ALSO MEAN:

- F**inding help and guidance to master information retrieval.
- F**ocusing on understanding the concepts you missed on the test.
- F**ollowing tips the instructor gives you for future success.
- F**iguring out ways to improve your ability to take tests.
- F**anatically reviewing texts and lecture notes to find out why you made mistakes.

**CHANGE THE WAY YOU TAKE TESTS BY ASSUMING CONTROL OF THEM
THROUGH YOUR NEW PERCEPTION OF F's.**

Reduce Anxiety Through Writing

When you find yourself anxious before tests, take a few minutes to write down all of the perceived reasons for your fears. You may find that you are giving more power to the test than you should. The writing process will help you understand that some of your fears might be unrealistic. After you write down the thought, write down if the fear is based on reality. Acknowledging the fear behind your test anxiety is the best way to eliminate it.

Use Relaxation Techniques

When you start to feel lightheaded or have heart palpitations, take a deep breath and relax. You may find the following progressive relaxation steps helpful:

1. Breathe deeply from your stomach three times.
2. Roll your neck around from side to side slowly.
3. Imagine your neck muscles relaxing, then your shoulders, back, arms, legs, and feet. Rotate your feet in circles three times.
4. Acknowledge that you are relaxed, that you feel calmer, and that you do have the ability to do well on tests.
5. Whenever physical signs of anxiety return, go through these steps again.

Use Visualization

Visualization allows your thoughts to move away from anxiety and fear. Instead, you can focus on being relaxed and on the task of remembering answers to test questions.

- ▶ When you see a test question and you are not sure about the answer, try to create a picture in your mind that could answer the questions. (Visualize the page it was on in the text, the graph next to it, or the joke the instructor made about it.)
- ▶ Often, visualization will allow you to remember graphs, specific notes from the board, pictures, or even definition boxes from texts. This memory lets you answer the questions correctly and gain more confidence as you work through the test.
- ▶ Visualize yourself remembering the answers.
- ▶ Visualize places in the text that contain answers to questions on the test.
- ▶ Visualize yourself in your study area studying the concept. (Often, this mental picture will trigger traces of memory that will bring the answer into consciousness.)
- ▶ Visualize yourself in the classroom taking notes on this concept.

EXERCISE

Combating Test Anxiety

The purpose of this exercise is to help you understand the situations and perceptions that increase test anxiety.

Finish the following sentences to help you understand what part test anxiety plays in your life. If you do not experience test anxiety, complete only the last sentence. Break into groups of three to five students and discuss your answers.

1. I experience test anxiety when

2. When I experience test anxiety, I feel

3. I combat test anxiety by

4. I do not experience test anxiety because

Step Inside . . . Peer Study Groups

Why study alone when so many excellent resources surround you in your classrooms? If you could find a quick, enjoyable way to study, wouldn't you do it? The time to tap into those resources is now. Talk to your peers about forming a study group.

Forming study groups in college is one of the best decisions that you can make. Study groups provide support, friendship, solid academic experiences, and fun. When you cannot make it to class because you are sick, members of the study group will take notes for you. When you cannot decipher words in your notes, call a study group member and ask for clarification. When you do not hear your alarm and almost miss your study group session on Saturday morning, your study group will call you to join them, and influence you to study harder than you would on your own. When you offer your knowledge and expertise about computers to the group, they in turn offer their expertise in history or biology. It is good to know that in a study group someone else usually has a strength in the subject in which you have a weakness. When you are tired of rehearsing terms, who pushes you on? Your study group.

Do not make excuses for not forming a study group. Even though study group members have different schedules (many work, some have children, others run their own businesses), you need to make study group time a priority. The study group will save you time in the long run because five minds work faster than one. They will be your motivator when your motivation is low. They will help you understand concepts when you are about ready to give up. They are the ones who will share your joy, reflect on the tough times, and provide mutual understanding as you walk across the stage at graduation. They are the ones who will teach you how to work effectively as a team.

Go ahead, right now. Seek out classmates who are willing to learn with peers, commit to learning, and find a support system that will never be forgotten.

Internet Exercise

Look up "test anxiety" on the Internet. List three ways to fight anxiety that are not mentioned in this chapter. Remember to list the Web site address and the author of each article that you access.

1.

2.

3.

Review

This review is correlated with the objectives at the start of the chapter. One way to study this chapter is to look at the objectives, write down everything you learned about each one, and then compare your notes to this review.

1. *Test-taking strategies.*

Before the test: Create practice questions. Do not lose sleep the night before a test. Review notes daily. Exercise before tests.

During the test: Figure out what works best for you in test-taking situations. Remember that you are in control of the test; the test does not control you. When you receive the test, scan it. Visualize yourself being successful.

After the test: Take the initiative in changing low grades to higher ones. If you are not satisfied with your grades, take the responsibility for changing your studying strategies. Seek out the correct answers by returning to your text and looking up the answers to the test questions that puzzled you.

PART II

Problem Solving

Problem Solving: Procedure and Organization

CHAPTER

3

Louis W. Ascione

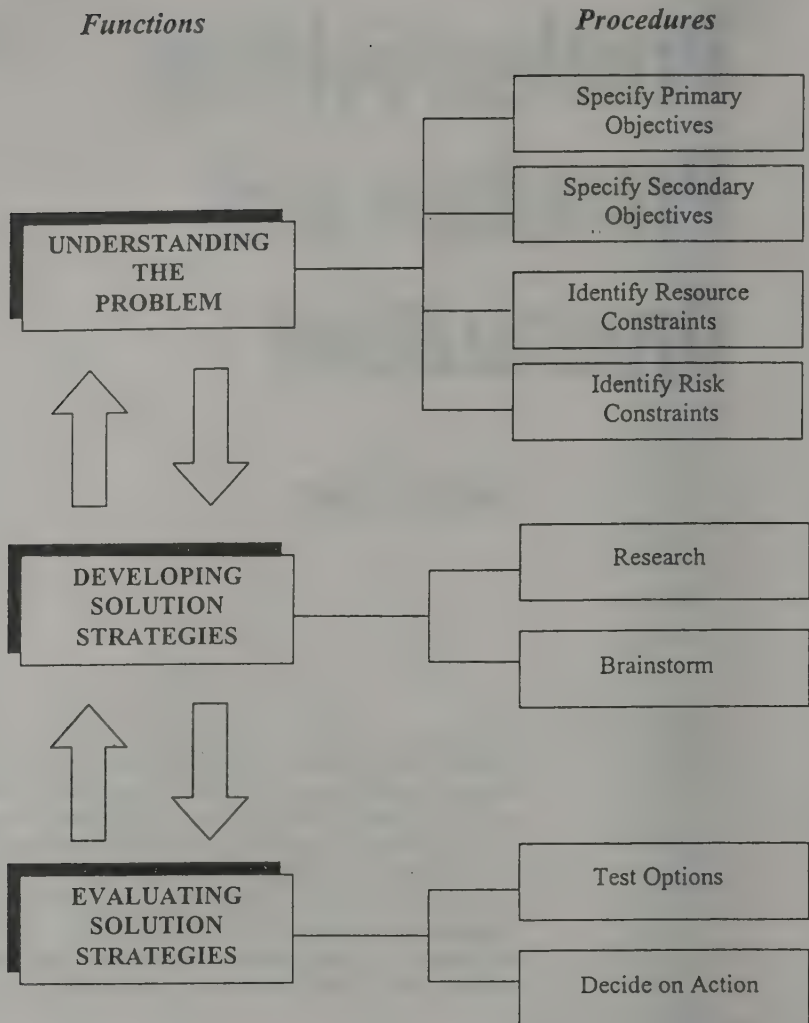
Although the problem solving process consists of three basic functions: understanding the problem, developing solution strategies, and evaluating solution strategies, each function can only be carried out effectively by means of specific procedures which are associated with them. Therefore, the specific procedures which underlie each basic function of the problem solving process are instrumental to the success of the problem solving process as a whole. It is the nature and practical operation of these procedures that will be the focus of this chapter. Before beginning, however, it would be a good idea to take another brief look at the general problem solving process, including the procedures associated with it. The diagram on page 58 will be used as a reference for the rest of this chapter.

Procedures for Understanding Problems

Everyone uses procedure, of one sort or another, everyday, whether they are aware of it or not. If we did not use procedure, we could not accomplish even the most common activities in life. However, to be a procedural problem solver means that we are aware of the procedures we utilize and we choose them because they are the most rational procedures available to us. By being a procedural problem solver, we are always attempting to maximize the effectiveness of the problem solving process.

As we already mentioned, understanding the problem is the most important function of the problem solving process. Effective problem solving can only begin once a problem is fully understood, and this requires both patience and procedure. Therefore, when face with a problem, we must always take enough time to patiently (1) specify the primary objectives of the problem, (2) identify the constraints of the problem, and (3) state the secondary objectives of the problem.

Of course, this process is not quite as easy as it appears. In order to know the full extent of the objectives and constraints of a problem, we must first go through the entire problem solving process a few times, attempting to solve the problem, to get a good idea as to its nature. Once again, the problem solving process is not linear, but



The problem solving process

complex. Let's now look at some specific procedures for organizing and understanding problems.

Causal Analysis

When dealing with certain types of adaptive problems, it is often necessary to determine the cause of the problem in order to solve it effectively. The types of problems being referred to here are problems that occur within a system which is functioning properly at one point in time, but begins to malfunction at some later point in time. In the simplest terms possible, we need to find causes of problems in which something is 'broken.' For instance, if our car will not start in the morning, we can only remedy the situation by discovering the cause of the car's malfunction. We drove the car home yesterday, so we know it was working properly then, but today it will not start. Therefore, something must have changed between yesterday and today which is preventing the car from starting; the question is "what?"

Because we wish to fix the car as soon as possible, we begin asking ourselves some very normal questions such as: What's wrong with my car? or, Why won't my car start? These types of questions are all requests for knowledge regarding the specific cause of our car's malfunction, and it is assumed that if we determine this cause, then we can form a plan for repairing it. Clearly, we cannot even begin fixing our car until we know what is wrong with it. We call this search for causes in a malfunctioning system "troubleshooting," and we can best carry out the activity of troubleshooting if we employ a simple yet effective procedure called *causal analysis*.

There are two general steps to the procedure of causal analysis: (1) listing all the possible causes of a problem, and (2) testing each possible cause with the aim of eliminating those which prove not to be the actual cause. In this way, we narrow down all possible causes until we are only left with a single cause, which must be the actual cause. In other words, we list every alternative hypothesis as to what could have caused a problem, and then we do our best to demonstrate that each alternative is in fact false. Only the actual causes of a problem will withstand any attempts to eliminate them as false. This second step of the process of causal analysis is often referred to as 'the process of elimination.'

Notice again that causal analysis involves all the functions of the problem solving process, but the focus is on understanding the problem, which in this case, means discovering the cause of the problem. Causal analysis, like all problem solving procedures, is complex in the same sense that the entire problem solving process is complex. When undertaking a causal analysis, we do our best to exhaustively list out all possible causes for a specific event. However, it is neither practical nor rational to attempt to list *all* possible causes for the event. We must begin the process by listing all the possible causes that seem reasonable or apparent to us at the time. Once we start testing our list of possible causes, we get a better idea as to whether or not our list of possible causes needs to be revised in any way. The results of our tests are a source of new information that must be taken into consideration. Therefore, this new information may lead us to re-evaluate the situation and develop a new understanding of the problem, which might then give us insight into new possibilities regarding possible causes.

Let's look at how causal analysis works using the example, just mentioned, of the car that will not start. If we want to find out why our car is not starting, that is, if we want to discover the cause of our problem, we must first make a list of all possible reasons that a car will not start. Of course, to do this we need to know something about how cars work. If we have no mechanical understanding of a car's normal function, we cannot even begin a causal analysis of a malfunction. However, assuming a general knowledge of how a car functions normally, we can generate a list of all possible reasons why a car will not start. Certainly, we would begin compiling such a list by making a survey of all of the components in a car which are directly related to its ability to start. A list of reasons why the car will not start will thus include all statements that indicate a malfunction of one of these components.

For example, certainly a charged battery is needed for a car to start, so that one reason why a car might not start would be a dead battery. Also, a car must have gas to start, so that another possible cause for a car to fail to start may be that it is out of gas. Of course, a complete list of all the components of a car that are involved in the starting function is quite long, so for simplicity's sake, let's imagine that there are only three reasons why a car will not start: (a) the car is out of gas, (b) the starter is broken, (c) the battery is dead. If these are the only possible reasons why a car would not start, then we have a complete set of possible causes for our problem, and our task is to determine which one of these is actual. Again, we do this by trying to demonstrate that each one of these alternatives is false. The alternative we cannot prove to be false will most likely be the cause of our problem.

The attempt to demonstrate that a hypothesis is false defines the most general meaning of "testing," and we begin testing our three hypotheses by determining what kinds of evidence would prove them false. For example, the first hypothesis,

namely, "the car is out of gas," would be proven false simply by examining the gas tank. If there is gas in the tank, then the hypothesis "the car is out of gas" turns out to be false and can be eliminated as a possible cause for our problem. Now, we have only two possible causes left: (b) the starter is broken, and (c) the battery is dead. We might test the battery by using a simple voltage meter to see if the battery has the proper charge. If it does, then the battery cannot be the cause, and the starter, being the only alternative left, must be preventing the car from starting. The faulty starter is therefore the actual cause of the problem.

Troubleshooting is thus an activity of taking all the potential causes of a problem and isolating the actual cause(s) from among them. In order to be more procedural in causal analysis, as well as to make our causal analysis more explicit for others, it is often helpful to use a causal analysis chart. We construct a causal analysis chart by listing our hypotheses of all possible causes of a problem in a column. Then we list the tests which can be made that are capable of falsifying each of our hypotheses. Lastly, we list the results of each test already conducted as a means of keeping track of our progress. The finished chart of our simplified causal analysis would look like this:

CAUSAL ANALYSIS CHART		
POSSIBLE CAUSES	TESTS	TEST RESULTS
DEAD BATTERY	CHECK VOLTAGE	NEGATIVE
OUT OF GAS	CHECK TANK LEVEL	NEGATIVE
BROKEN STARTER	EXAMINE THE PART	POSITIVE

Of course, it may be the case that the number of possible causes for a specific problem are so great that it is not practical to list and test them all. In such instances, we must troubleshoot in stages from general to particular. In other words, we attempt to isolate the problem little by little. For example, given the true number of possible causes for a car not to start, auto mechanics may begin troubleshooting with a more general causal analysis which breaks the possible causes into categories and then, through testing, eliminates entire categories, such as electrical problems, fuel problems, or mechanical problems. Simple tests can be used to determine that the cause of the problem is not electrical in nature and not related to the fuel system. Once this is ascertained, we are left with mechanical problems as the category in which the actual problem must be contained. This more general Causal Analysis Chart would look like this:

GENERAL CAUSAL ANALYSIS CHART	
POSSIBLE CAUSES	TEST RESULTS
ELECTRICAL	NEGATIVE
FUEL	NEGATIVE
MECHANICAL	POSITIVE

In this fashion, a problem can be isolated into a particular category, and then each possible problem within that category can be tested and the actual cause determined. Once we have determined that the problem must be mechanical in nature, we can begin listing all the possible causes for our car's malfunction in a more limited and practically manageable way. Our next causal analysis chart would list only those possible causes of the problem that are mechanical in nature, yet

would list all the mechanical components that are related to the starting function of the car to determine which are defective.

It is important to note that we can only effectively determine causes by eliminating those hypotheses which turn out to be false when tested. It is *not* the case, that a hypothesis that turns out true when tested is necessarily the sole cause of the problem or even the most important cause of a problem. For example, if we test the battery and we find out that it is not fully charged, does this mean that everything else is functioning properly? Certainly not. It may be that the car is also out of gas and the starter is not working. In fact, it may be the case that the battery has a low charge because we wasted a lot of the charge trying to start a car with no gas and a broken starter. Therefore, we can only be certain about causes by determining what is not the problem, so that the problem will be what is left at the end of causal analysis.

One thing that must be kept in mind, however, is the fact that if we are experienced enough with a particular system, we may have a pretty good idea as to what the cause of the problem is just by collecting enough data regarding the symptoms of the problem. For instance, a good auto mechanic may simply listen to what happens when we try to start the car and determine that it is probably the starter. He or she would then examine the starter to see if it is indeed the cause of the problem. If it is, the problem is solved. However, if it is not, and the mechanic is genuinely perplexed at the cause of the problem, then the process of troubleshooting must begin in an organized and procedural fashion using causal analysis.

Procedures for Developing Solution Strategies

The basic function of Developing Solution Strategies, involves two specific procedures: research and brainstorming, and the primary consideration for both these activities is volume. Because the objective of research and brainstorming is to develop as many solution strategies as possible, it is important to organize them in such a way that we can keep track of what kinds of solutions we have already come up with, and what kinds of solutions we have yet to generate. Organizing solution strategies is therefore often a good way to stimulate the production of even more solution strategies systematically.

One way of organizing solution strategies as we develop them is to make a *comparison chart*. In a comparison chart we unify all solution strategies developed into a single structure, so that we can create list of the all the consequences of implementing each solution strategy as we test them. The value of a comparison chart is that it facilitates the evaluation of each solution strategy by placing all the consequences of each solution strategy side by side for easy comparison. Typically, we break down the consequences of each solution strategy into advantages and disadvantages. Comparison charts are most effective when dealing with a fairly small amount of solution strategies that each have several advantages and disadvantages.

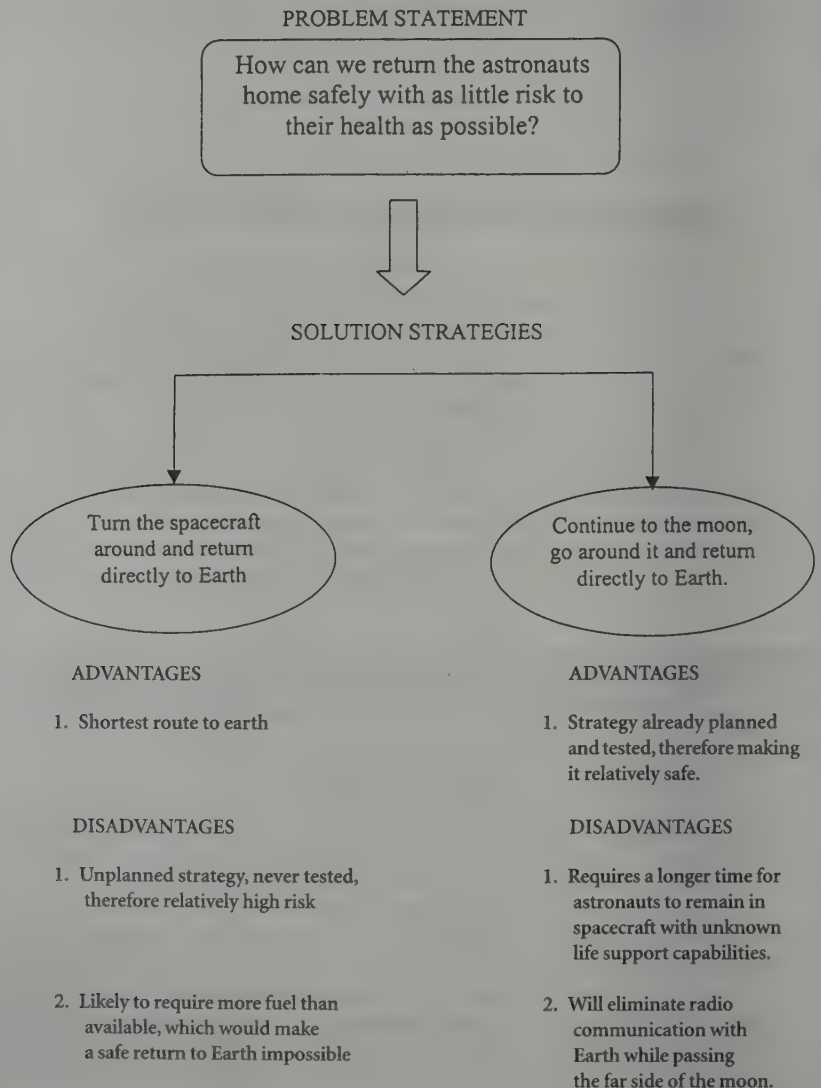
For example, given a problem, such as that of Apollo 13, the first action to be taken in order to solve the problem is to first state the primary and secondary objectives clearly, and identify the constraints. Then, solution strategies can be developed for achieving these objectives within the boundaries of the constraints. Lastly, we can categorize this list into an organized format. The primary objective of Apollo 13 after the accident was to return the astronauts to earth safely. The secondary objective of this mission was to minimize any danger to the health of the astronauts. The constraints for achieving these objectives was the insufficient amount of electricity needed for the spacecraft to function properly. Therefore, the solution to the problem had to be a plan that got the astronauts home safely, without using very much electricity.

Once the problem was made explicit, solution strategies were developed. Due to the fact that Apollo 13 was still on the way to the moon, there were basically two general types of solutions that could be implemented. First, the spacecraft could be

turned around and flown directly home, and secondly, the spacecraft could continue towards the moon, go around it, and then come back home. Essentially then, we have two general solution strategies for getting the astronauts home safely, and we can represent this situation by taking the explicit problem statement that emerged from the first function of the problem solving process (understanding the problem) and connecting it with all potential solution strategies.

Once this is accomplished, we must simulate each option in an attempt to elaborate the consequences of implementing each solution strategy. For instance, one of the consequences of implementing the first solution strategy is that the astronauts would be travel the shortest possible distance to earth thus getting them home as soon as possible. The less time the astronauts spend in space, the less risk to their health. Another consequence of this same strategy, however, is that they run a serious risk of burning up all their remaining fuel in attempting such a maneuver, which would make re-entry into the earth's atmosphere uncontrollable and therefore, likely to be

Comparison Chart



fatal. Regarding the second strategy, one consequence of its implementation is that the spacecraft will take the longest possible route back to earth. On the other hand, it is also the most efficient use of energy since it requires very few course corrections.

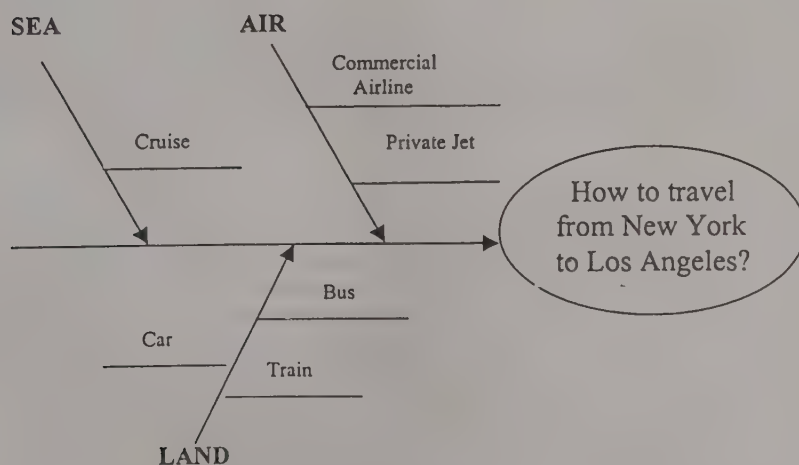
Once we have identified the consequences of each solution strategy, we can further categorize them in terms of advantages and disadvantages with regards to their potential for attaining the primary and secondary objectives. A simple comparison chart for the Apollo 13 mission appears on page 62.

However, not all sets of solution strategies are small enough for us to use a comparison chart effectively. It may be the case that there are a large number of general solution strategies to a given problem, or general solution strategies might include several different means for achieving them. In such cases, we would adopt a more complex method of representing potential solution strategies. For example, given the problem of how to get from New York to Los Angeles, we can imagine several general means for accomplishing this goal. Basically, we could go by (1) land, (2) air, or (3) sea.

Then, for each mode of transportation, we can imagine various alternatives. For instance, if we decide to travel to Los Angeles by land, we could either drive a car, take a bus, take a train, hitchhike, etc. Similarly, if we decide to go by air, we could use any number of commercial airlines, or we could hire a private jet to take us. Let's imagine a cruise is the only available means to travel from New York to Los Angeles by sea. Clearly, our choice to travel by land, air or sea will be affected by the nature of the specific methods of transportation which are available to us in each category. Therefore, we must examine the advantages and disadvantages of each specific means of transportation in order to make an intelligent decision, and this requires a more elaborate form of organization than a comparison chart.

One common method for organizing such a large array of alternative solution strategies is something called a 'fishbone diagram.' An example of a fishbone diagram is the following:

Fishbone Diagram



The benefit of using a fishbone diagram is that it allows us to effectively narrow down the number of options we have for solving a problem by providing a means for eliminating whole categories or parts of categories from our list of solution strategies. For example, let's imagine we have specific constraints regarding the time and money available to us for accomplishing our goal. Therefore, going to Los

Angeles by sea is probably not a viable alternative because it requires a long and expensive cruise from New York to Central America, through the Panama Canal, back up along the coast of Mexico and Southern California to Los Angeles. The time and money needed for such a journey is perhaps not available to us, so we would eliminate the idea of going to Los Angeles by sea, leaving land and air travel as the only alternative means.

Of course, any method of organizing a list of solution strategies is acceptable. Fishbone diagrams are only one particular method for organizing ideas. The point is that by organizing and categorizing our potential options, we put ourselves in a better position to systematically eliminate those solution strategies which are clearly unacceptable. This, in turn, makes evaluating solution strategies more efficient. If we know exactly what our options are, it is easier to make a rational decision as to which one is preferable.

Procedures for Evaluating Solution Strategies

The whole point of organizing solution strategies is to facilitate their evaluation which is the third function of the problem solving process. Once we have developed a sufficient number of reasonable solution strategies, the next step is to evaluate them by testing each solution strategy against the criteria for success established in our understanding of the problem, namely, the problem objectives and constraints. The whole point of problem solving is to make a rational decision regarding action, and it is in the evaluating function of the problem solving process that we finally get around to the actual solving of the problem. It is here that ends and means come together at last, but the path by which we arrive at a solution is circuitous.

We had to understand the problem in order to develop solution strategies, and the development of solution strategies, in turn, helped to further understanding the problem. The solution strategies developed became the subject matter for testing and simulating, and the activity of testing and simulating led to the development of even more solution strategies. Testing and simulating options are undertaken for the sake of making a decision on what action should be taken, and would have not meaning outside of this context. However, the activity of deciding a course of action relies entirely on the results of the testing and simulation of solution strategies to supply the information which makes up the content of the decision. Lastly, the criteria by which we create, set up and evaluate tests that inform decision making, comes from our original understanding of the problem.

Let us now look at the process of rational decision making by creating a *decision chart* based on the previously given problem of trying to get from New York to Los Angeles. Although a decision chart is not always necessary for making rational decisions, it is an excellent model of the process we undergo when we make a decision rationally. In order to begin a decision chart, we need to understand the problem objectives and constraints because these establish the criteria by which we set up tests for solution strategies and, therefore, decide on a course of action.

We know the primary objective of the problem in question was to get from New York to Los Angeles. What we do not yet know are the secondary goals and the constraints that define the problem as a whole. We can imagine the secondary objectives being to get to Los Angeles as soon as possible, and minimize travel time. Our constraints are that we cannot spend more than \$300 dollars, and we must be there within a week.

Given these objectives and constraints, we have begun to understand the problem and can now use this understanding to produce the criteria with which to evaluate our solution strategies. Again, the way to best illustrate this is through the construction of a decision chart in which the criteria are related to the alternative solution strategies in such a way that simple procedure will help us to determine

which of the alternatives is the best and should therefore be pursued. We accomplish this by listing all the alternative solution strategies in a row across the top of the chart, all the primary objectives and constraints in the left column and all the secondary objectives directly below them. The completed decision chart would look like this:

		ALTERNATIVE SOLUTION STRATEGIES				
		Private Jet	Commercial Jet	Bus	Train	Car
PRIMARY OBJECTIVES AND CONSTRAINTS (NECESSARY CRITERIA)	1. Must be a reasonable means for travelling from New York to Los Angeles					
	2. Must cost less than \$300.					
	3. Must get us to destination within the current week.					

SECONDARY OBJECTIVES (DESIRED CRITERIA)	Weight	Rating	Rating	Rating	Rating	Rating
1. Minimize travel time.						
2. Get us there as soon as possible.						
SCORE (Weight × Rating)						

When evaluating a list of alternative solution strategies, we first use the process of elimination to narrow down the alternatives by discarding any solution strategies which do not fulfill the necessary requirements set by the primary objectives and constraints. Remember, we call the primary objectives and the constraints of a problem “necessary requirements” because if they are not satisfied, the problem (by definition) will not be solved. For instance, in the above stated problem, no solution strategy can be successful if it does not result in the achievement of our primary objective, to get to Los Angeles. Furthermore, no solution strategy can be successful if it costs more than we can afford, or if it requires more time than we can spare. Therefore, we can effectively eliminate any solution strategies that either would not result in the achievement of our primary objectives or would surpass the boundaries of any of our constraints.

We can represent this on our decision chart by determining whether or not each alternative satisfies all the necessary requirements. In this case, we have to find out the cost of each alternative as well as the travel time involved. For example, if there are any solution strategies which do not cost less than \$300, they must be immediately eliminated from consideration as potential solutions because they do

not satisfy the necessary requirements for solving the problem. Likewise, any solution strategies which cannot achieve the goal within a week must also be eliminated. If a solution strategy satisfies the necessary criterion we write "OK" in that column and continue to check the rest of the criteria. If a solution strategy does not satisfy a necessary requirement, we eliminated it entirely and we write "no" in that column and cross out the rest of it.

Let's imagine that after researching the situation, we discover that all the solution strategies we generated are in fact methods for getting from New York to Los Angeles. Next, we research the cost of each and determine that every mode of transportation except the private jet can be utilized for under \$300. At this point, we would eliminate the private jet idea because it fails to satisfy this necessary requirement regardless of how well it satisfies any secondary objectives. We can now complete the check of necessary requirements by determining how soon each means of transportation can get us from New York to Los Angeles. Let's imagine that all methods of transportation could get us to Los Angeles within a week, but that to book any commercial flight within the week would cost much more than \$300 dollars. Perhaps we could only get a ticket to Los Angeles for less than \$300 if we book our reservation at least ten days in advance. Therefore, we would now eliminate this option from our list of alternatives as well. Our decision chart, at this point, looks like this:

		ALTERNATIVE SOLUTION STRATEGIES				
		Private Jet	Commercial Jet	Bus	Train	Car
PRIMARY OBJECTIVES AND CONSTRAINTS (NECESSARY CRITERIA)	1. Must be a reasonable means for travelling from New York to Los Angeles	O.K.	O.K.	O.K.	O.K.	O.K.
	2. Must cost less than \$300.	NO	O.K.	O.K.	O.K.	O.K.
	3. Must get us to destination within the current week.		NO	O.K.	O.K.	O.K.
SECONDARY OBJECTIVES (DESIRED CRITERIA)	Weight	Rating	Rating	Rating	Rating	Rating
1. Minimize travel time.						
2. Get us there as soon as possible.						
SCORE (Weight $\times$ Rating)						

Once we have eliminated any solution strategies which do not satisfy the necessary requirements, we are free to decide from among the remaining solution strategies according to how well they satisfy secondary objectives. The first thing to do is

determine the relative importance of each secondary objective. We can refer to this importance as its *weight*. Usually, we establish the weight of secondary objectives on a scale of 1–10 but any scale can be used. Let’s imagine that we weigh our secondary objectives by reasoning that minimizing travel time is important to us but not as important to us as getting to our destination as soon as possible. Therefore, we might give the first secondary objective a relative weight of 4, while the second secondary objective a relative weight of 7.

We fill in these weights, and then we *rate* each alternative solution strategy according to how well it satisfies each secondary objective. For example, taking a bus from New York to Los Angeles would rate low in terms of minimizing travel time. On a scale of 1–10 it would probably rate 3. Furthermore, it may be the case that buses do not leave from New York bound for Los Angeles very frequently, so that we might have to wait a little to get the bus. Thus, taking a bus to L.A. might rank fairly low with regards to the second secondary criteria as well; let’s give it another 3.

A train would be a little faster than a bus, and we could rank it as a 6 for the first secondary objective, but it would also involve some waiting for the departure time just as would a bus, so it rates as a 4 regarding the second secondary objective. Lastly, taking a car to Los Angeles would not be much faster than a bus, but might be little faster if we want to make it faster, but slower than a train, so we give it a rating of 4 for minimizing travel time. However, we can leave whenever we want to if we are driving ourselves. A train may be faster, but we can leave sooner in the car. Hence, it gets a rating of 4 for getting there as soon as possible. Now all we have to do is determine a score for each alternative and it would be rational to choose that with the highest score, which in this case turns out to be taking the train. A finished decision chart would thus look something like this:

		ALTERNATIVE SOLUTION STRATEGIES				
		Private Jet	Commercial Jet	Bus	Train	Car
PRIMARY OBJECTIVES AND CONSTRAINTS (NECESSARY CRITERIA)	1. Must be a reasonable means for travelling from New York to Los Angeles	O.K.	O.K.	O.K.	O.K.	O.K.
	2. Must cost less than \$300.	NO	O.K.	O.K.	O.K.	O.K.
	3. Must get us to destination within the current week.		NO	O.K.	O.K.	O.K.
SECONDARY OBJECTIVES (DESIRED CRITERIA)	Weight	Rating	Rating	Rating	Rating	Rating
1. Minimize travel time.	3			3	6	4
2. Get us there as soon as possible.	5			3	4	4
SCORE (Weight × Rating)				24	38	32

If, upon completion of a decision chart, it turns out that two or more solution strategies attain an equal or close to equal score and their score is higher than the other solution strategies, then those solution strategies are essentially equivalent or close to equivalent in consequence. Therefore, it is equally rational to choose any such solution strategy.

The Concept of Inference

CHAPTER 4

Louis W. Ascione

Inference and Problem Solving

INFERENCE: Productive thought, i.e. the mental activity of taking given information or input and using it to produce new information or output. The only type of thinking that is potentially intelligent. Inference is often called “reasoning.”

By being procedural problem solvers, we always use the most rational procedures available to us when going through the problem solving process. However, the process of thinking itself also requires rational procedure if it is to be optimally productive within the problem solving process. The fundamental process of thought that underlies all intelligent activity is something called *inference*, and the type of inference that produces optimal results is called *logical* inference. Procedure is useless without the ability to use logical inference. While impatience interferes with procedural effectiveness, illogical inferences destroy it. The most rational procedures in the world are worthless if the person using them does not use logical inference.

When solving a problem, we must begin with data. However, it is of utmost importance that the data we work with be true; false information is of no value for problem solving. Furthermore, logical inference is not possible given false data as its input, which in turn, makes procedure ineffective. Therefore, we must be critical of the data we receive. We must question its truth and the evidence that is used to support it. If there is no evidence to believe the truth of the data presented to us, then it is irrational to attempt to use it to solve a problem.

To be critical means to take an active role in testing data that is presented to us, and not just passively accepting what we are told. If we are critical, we ‘filter’ the information that is presented to us as a form of ‘quality control’ over the contents of our thinking. If we are not critical of information presented to us, then we have no control over the content of our thinking, and may in fact be attempting to solve problems using false information. As was just mentioned, this is both irrational and counterproductive. We will now examine the meaning of both logical inference and the critical evaluation of data in detail.

Understanding Inference

In order to go through the problem solving process, a specific type of thinking is necessary and we call this type of thinking *inference*. To go through the problem solving process effectively, it is imperative that the inferences we make throughout the problem solving process be *logical*. Therefore, the ability to consistently make logical inferences is one of the most important skills required to go through the problem solving process intelligently. To develop this skill, we must first gain a solid understanding of the nature of inference and what it means for an inference to be logical.

Understanding inference is not an easy matter because it is such a basic mental activity that it is most often carried out unconsciously. Although we all make inferences constantly in life, we rarely speak or think about them directly, and this means that the average person tends to lack both the vocabulary and concepts needed to understand the nature of inference as well as the criteria with which to evaluate it. Therefore, the study of inference begins with the tedious but essential activity of learning somewhat technical and often abstract vocabulary and concepts. Only by learning the 'language' of inference are we able to understand it to such a degree that we are able to improve our own ability to make logical inferences as well as effectively evaluate the inferences of others.

Perhaps the best way to define the activity of 'inference' is as 'productive thinking.' This means that inference is the activity of taking existing or given information and using it to produce new information. Inference thus takes the following form:



Because of the fact that inference is productive thinking, it is the most fundamental process for any mental activity required for intelligent behavior such as: making decisions, evaluating, interpreting, explaining, predicting and calculating. The only mental activities for which inference is not the most fundamental process are those types of thinking that are nonproductive such as: day dreaming, imagining, fantasizing, night dreaming, etc. Therefore, inference makes up the vast majority of mental activity that we normally refer to as 'thinking,' and this special type of thinking, which is often referred to as 'reasoning,' is an integral and necessary part of all behavior which we can rightfully classify as intelligent.

However, it is not the case that all inference is of equal value. Clearly there is 'good' inference and 'bad' inference. Only 'good' inference is useful for intelligent behavior, and we refer to the study of this type of inference as *logic*. Through the study of logic, we learn the criteria for making logical inferences, and we use this criteria to evaluate both our own inferences and those of others in an attempt to maximize the effectiveness with which we go through the problem solving process. By making certain that only logical inferences are used within the problem solving process, effective problem solving becomes possible and intelligent behavior becomes more likely. If we cannot be sure that the inferences made throughout the entire problem solving process are logical, then we cannot be effective problem solvers and we greatly reduce the probability of acting intelligently.

Let us now look at some examples of inference:

- (1) A person playing chess relies on inference to decide what move to make. He or she is given specific information, namely the setup of the board, and must use this information to produce new information regarding the best move to make.
- (2) A detective, who is given clues (information) regarding a crime, must use this information to produce new information regarding the identity of the criminal.
- (3) Scientists, given information regarding a particular physical phenomenon must use this information to produce new information which will *explain* the phenomenon in question.

LOGIC: The study of inference as a means for its continuous improvement, i.e. the practical science of inference.

- (4) A doctor is given a patient's symptoms and test results and must use this information in conjunction with his or her medical knowledge to produce a diagnosis of the patient's problem.

In all four cases something is being figured out, calculated or concluded using only a given set of information; this is the defining feature of all inference.

Propositions and Arguments

PROPOSITION: A sentence that has a truth value, i.e. a sentence that is either true or false. Propositions are the basic units of an argument, i.e. all premises and conclusions must be propositions.

ARGUMENT: The basic unit of inference. Arguments consist of premises and conclusions.

Because of the fact that inference involves the manipulation of information, it can only take place within the medium of a representational system, such as a natural or an artificial language. While computer inference takes place within an artificial language, human inference (which is what we are concerned with at this time) takes place within a natural language, e.g. English. The basic unit of representation in natural language is a *proposition*, and propositions make up the basic unit of inference which is called an *argument*. Propositions constitute the content of inference, while arguments constitute its structure. In ordinary language we refer to the basic units of representation in natural language as 'beliefs,' and the basic unit of inference as an 'idea' or a 'thought.' The problem with these words, however, is that they are too vague and ambiguous to be used in logic. Therefore, the logical analysis of inference begins with a technical understanding of both propositions and arguments.

Propositions

As it was just mentioned, propositions are the basic units with which we represent the world in natural language. A proposition is a sentence that states something about the world and as such has a "truth value," meaning that it is either true or false. We do not have to know the truth value of a sentence for it to be a proposition; we only have to know that it has a truth value. In other words, we can identify a sentence as a proposition without actually knowing whether it is true or false; we only have to know *that* it is either true or false. For example, the following sentences are all propositions:

- (1) Chicago is a city in the United States.
- (2) No one has ever run the mile in under three minutes.
- (3) There are four sides to a square.
- (4) Some people in London own cars.
- (5) All animals know how to swim.
- (6) France is a country in Africa.
- (7) If we win, then I'm going to celebrate.
- (8) Today is Tuesday.
- (9) Tomorrow it will rain.
- (10) There is life outside our solar system.

What qualifies these sentences as propositions is the fact that they all claim something about the world and are therefore either true or false. If a sentence claims something about any aspect of the world, either past, present or future, it is a proposition. Propositions may be claims that are well known facts such as sentences (1) and (3). They may be well known falsehoods such as sentence (6), or sentences that are sometimes true and sometimes false such as (8) and (9). Propositions may be lesser known facts such as sentence (2), or conditional claims such as sentence (7).

However, propositions may also be claims about the world which we have no idea if they are true or false such as sentences (5) and (10). The point is, it is not necessary to know the truth value of a sentence for it to be a proposition because it does not matter if it is true or false; it only matters that we know one of the two must be the case. Take sentence (10) for example. We may not know for sure if there is life outside of the solar system, and in fact we may never know. However, we do know that it is true that there either is or there is not life outside of the solar system at this point in time. Therefore sentence (10) is a proposition.

Non-Propositions

While it is true that all propositions are sentences, it is not the case that all sentences are propositions. There are many sentences which do not claim anything about the world because they have a different function in language. Sentences that do not claim anything about the world do not have truth values and are therefore not propositions. The following are examples of non-propositions:

- (1) Close the door!
- (2) What color is that?
- (3) Thank you for coming in on such short notice.
- (4) Don't do that, it's dangerous.

What makes these sentences non-propositions is that they do not claim anything about the world. These sentences perform other duties. For instance, sentence (1) is an order or a command and therefore does not claim anything about the world. Sentence (2) is a question, not a claim. Sentence (3) is an activity of 'thanking,' and sentence (4) is an activity of 'warning.' None of these is an activity of claiming. Even though the second part of sentence (4), "it's dangerous" by itself would be a proposition, as it stands, it is part of a non-proposition. In fact, the proposition "it's dangerous" is being used as the reason to justify the activity of warning in the sentence, namely, "don't do it."

EXERCISE

Determine which of the following sentences are propositions. Write "yes" next to any sentence that is a proposition, and "no" next to any sentence that is not a proposition.

1. Take the money and run.
2. Sometimes you win, sometimes you lose.
3. There is no evidence to back the assertion that Homer, the epic Greek poet, was blind.
4. Were the Middle Ages really like that?
5. Most people who live in South America speak French.
6. Everyone knows the meaning of the word "wergild."
7. Invisible people cannot see.
8. When you find out what time the party starts, let me know.
9. The speed of light is a constant.
10. People should never treat each other with disrespect.

Arguments

PREMISES: The given information (input) of inference. Often called the “reason” or the “justification” for believing specific conclusions.

CONCLUSIONS: The new information (output) produced through inference.

An argument is a set of propositions structured in a such a way that the truth of one of the propositions is intended to be logically justified by the other propositions. Another way of saying the same thing is that arguments are sets of propositions in which some of the propositions are meant to be reasons for believing another proposition. The propositions that are used as reasons for believing another proposition are called *premises*, and the proposition that the reasons are intended to justify is called the *conclusion*. Every argument has at least one premise (although it may have any number of premises) and exactly one conclusion.

If we remember that an argument is the basic unit of inference, and the fact that inference is the activity of producing new information from given information, then we can also define the premises of an argument as the given information of the argument, while the conclusion represents the new information produced though the activity of inference. Here is an example of an argument:

If something has mass, then it is affected by gravity. Apples have mass, therefore apples are affected by gravity.

In this argument there are three propositions:

- (1) If something has mass, then it is affected by gravity.
- (2) Apples have mass.
- (3) Apples are affected by gravity.

The first two propositions of this argument are intended to justify the third proposition. In other words, propositions (1) and (2) are meant to be reasons for believing proposition (3). Therefore, propositions (1) and (2) make up the premises of the argument and (3) is the conclusion. Once again, we can also express the distinction between the premises and the conclusion of this argument in terms of given information and new information. The first two propositions constitute the given information in this particular inference and are therefore the premises of the argument, while the last proposition constitutes the new information produced through the process of inference and is therefore the conclusion.

Standard Form

In order to see this argument more clearly we can put it into what is called *standard form*, which looks like this:

- (1) If something has mass, then it is affected by gravity.
- (2) Apples have mass.

Therefore, apples are affected by gravity.

When we put an argument into standard form, we list and number the premises, draw a line underneath the premises and we then place the conclusion beneath the line so that the premises are clearly separated from the conclusion. Standard form helps us not only to see the argument more clearly but it also organizes an argument so that it is much easier to evaluate it, which is our ultimate objective. The same holds true in math. It is much easier to do a math problem if we first put it into standard form. For example, it is much easier to multiply 103×58 by hand if we first line it up as such:

$$\begin{array}{r} 103 \\ \times 58 \\ \hline \end{array}$$

One thing we must remember is that in everyday speech or writing, arguments are not always presented in such a neat form. Premises are not always individual sentences that are easily distinguished from the conclusion. Our first task in logic is to be able to identify arguments and organize them into standard form. For instance, the above argument might have been stated as such:

It is clear that apples are affected by gravity because it is true that if something has mass then it is affected by gravity, and apples certainly do have mass.

Although this is one long sentence, it still contains the same three distinct propositions, namely:

- (1) If something has mass, then it is affected by gravity.
- (2) Apples have mass.
- (3) Apples are affected by gravity.

Also, proposition (3) is still the conclusion while (1) and (2) are the premises. Therefore, these propositions retain the same inference structure as above and are organized precisely the same in standard form. The only distinction to be made between this statement of the argument and the one stated above is in the wording and order of the propositions. However, the exact words used in a proposition and their order are irrelevant to the nature of the argument. Both statements of the argument contain the same propositions, therefore it is the same argument.

For example, the word “because” replaced the word “therefore” in the second statement of this argument, but since they both indicate a separation between the premises and the conclusion, the meaning remains the same. Phrases like “it is clear” and “certainly” do not change the nature of the propositions of which they are part because they mean the same thing. In this case, both phrases simply affirm that we believe these statements to be true. In logic there is no difference between “it is clear that apples are affected by gravity,” “apples are affected by gravity,” or “it is true that apples are affected by gravity” because they are all logically equivalent in meaning.

Identifying Arguments

Because arguments can be stated in many different forms, it is often not so easy to figure out if a set of sentences forms an argument. Remember, for a set of sentences to be an argument, the sentences must be propositions and related in such a manner that one proposition is a conclusion and the others are premises. That is, there must be an instance of inference. To identify an argument, we must therefore determine if there are premises and a conclusion. One helpful hint for identifying arguments is by looking for specific words or phrases that indicate premises and conclusions. For instance, the word “therefore” is a conclusion indicator. If we see the word “therefore” in a sentence, it is guaranteed that the statement that follows it is a conclusion, and if there is a conclusion then there is an argument, so that the only goal remaining is to find the premises that support the conclusion.

The word “because” is a classic premise indicator. If we see the word “because” in a sentence, the statement or statements that follow it are premises. Unfortunately, while there are many words that indicate premises and conclusions, they are not always present in every argument. Therefore, it is a good idea to learn them, but it is not a good idea to depend on them. The following are lists of the most common premise and conclusion indicators.

<i>Premise indicators</i>	<i>Conclusion indicators</i>
because	therefore
since	then
as	thus
for	so
given that	hence
assuming that	accordingly
	consequently
	which implies
	as a result

Keep in mind that these lists are by no means exhaustive. There are many words that can indicate premises or conclusions depending on the context in which they are used, so that we must often rely on our knowledge of English to determine whether or not a set of propositions constitutes an argument. Furthermore, these words are also not always used as indicators. For example, in the sentence “The United States has been a country since 1776,” the word “since” does not indicate a premise but has another meaning entirely.

EXERCISE

Determine which of the following sets of sentences contain arguments. If a set of sentences does contain an argument, circle the conclusion and number each of the premises. If there is no argument, write “none” next to the number. *Hint: in order to identify arguments, it is a good idea to first look for a conclusion. If there is a conclusion, then there must be premises. Therefore, if there is a conclusion, it must be an argument.

1. If there is no evidence to prove that the defendant is guilty, then the defendant must be assumed innocent of the crime. There was no evidence to prove that the defendant was guilty in this case, therefore we must assume that the defendant is innocent.
2. Because of the fact that there are more cars on the road every year, and the fact that more cars means more accidents, we can conclude that the number of car accidents is going to increase every year.
3. Traveling in a foreign country is always more enjoyable when you are with someone who speaks the language of that country since the problem of communication is eliminated.
4. I like going to the movies. I especially enjoy adventure movies. However, sometimes there is nothing good playing in the theaters.
5. I think that I like Italian food better than Greek food because I know I like Italian food better than French food and I know that I don't like Greek food as much as French food.
6. Panicking is a form of irrationality. Therefore, if you panic, you are acting irrationally.
7. Antarctica is nothing but a block of ice, so why would anyone want to live there?
8. Anyone who eats well and exercises regularly is more likely to live a long and healthy life than anyone who does not. My uncle does not exercise at all, and as a result, he is less likely to live a long and healthy life.
9. When you gamble, you either win or lose. If you win, then you are lucky and if you lose then you are not. Last week I went to Las Vegas and won at craps, so that means I was lucky.
10. People who give up smoking and never start again tend to be the strongest proponents of anti-smoking laws. It seems that these people are the most offended by smokers, especially in public places.

Enthymemes

ENTHYMEME: An argument in which one or more of the premises or the conclusion is unstated because it is assumed to be obvious to the point of being unnecessary to state explicitly.

One of the challenges we run into when trying to identify an argument is that arguments are often presented in a compact format that is efficient for communicating to others but very difficult to express in standard form. That is, we often leave out important bits of information from arguments when we present them to other people because the information is so obvious that it is unnecessary to make explicit. We call arguments in which either a premise or a conclusion is unstated or ‘understood’ *enthymemes*. Take, for example, the following argument:

Francine broke her back while skiing on Saturday. So, I guess she won’t be going dancing with us this weekend.

If we are not careful, we might try to state this argument in standard form in the following manner:

(1) Francine has a broken back

Therefore, Francine cannot go dancing with us this weekend.

While this is a literally accurate representation of the argument, it is not a correct expression of all the propositions that make up this argument because it is incomplete. The person who stated this argument left out some crucial information because it is so obvious that it is not necessary to state, namely the idea that people with broken backs cannot go dancing. In other words, there is actually an unstated premise that makes up an important part of this argument so that a correct statement of this argument would look like this:

(1) Francine has a broken back
(2) (Anyone with a broken back cannot go dancing.)

Therefore, Francine cannot go dancing with us this weekend.

*Notice that the unstated premise was added in parentheses to express the complete argument.

As another example of an enthymeme look at the following argument:

We will never make it to the stadium before the game starts. We are ten miles away, and the game starts in less than a minute.

The unstated premise in this argument is: “we cannot travel ten miles in less than a minute.” This is so obvious to anyone that we would never bother to state it in an argument. However, we could imagine a child not understanding this concept and having to explain it to him or her. Once again, if we were to put this argument into standard form, we would still include this unstated premise in parentheses to clearly and correctly present the entire argument. In standard form the argument would look like this:

(1) We are ten miles away from the stadium
(2) The game starts in less than a minute.
(3) (we cannot travel ten miles in less than a minute)

Therefore, we will never make it to the stadium before the game starts.

When adding unstated premises to an argument we have to be careful not to include anything that is not clearly implied in the context of the argument. All we are doing when we add unstated premises to an argument is making explicit that which was previously only implicit in the argument.

EXERCISE

State the unstated premise or conclusion in the following enthymemes.

1. I will never eat at that new restaurant on 3rd Street again, because I had lunch there yesterday, and the food was terrible.
2. Given the fact that the Greeks were vastly outnumbered by the Persians, it was unlikely that they could have defeated them.
3. Of course, the defendant is guilty, we found the murder weapon in his house.
4. Frank was involved in six car accidents this month, so I imagine his insurance rates will be going up.
5. Angela had her purse stolen on the way to work and therefore had no money to buy lunch.
6. I worked 60 hours last week, so I should get a nice paycheck on Friday.
7. He said he didn't do it, and he has no reason to lie.
8. That team went from last place to first place in just a month. They must have been practicing a lot.
9. Swimming is one of the best exercises for complete physical fitness. I should start swimming on a regular basis.
10. George is very drunk. We better take his car keys from him.

PART 3

Critical Thinking

Thinking Critically

CHAPTER

5

John Chaffee

A college education is the road that can lead you to your life's work, a career that will enable you to use your unique talents to bring you professional fulfillment. However, there are many other benefits to a college education, among them the opportunity to become what we have called an "educated thinker." Becoming an educated thinker is essential for achieving the greatest possible success in your chosen career, and it enriches your life in many other ways as well.

Traditionally, when people refer to an "educated thinker," they mean someone who has developed a knowledgeable understanding of our complex world, a thoughtful perspective on important ideas and timely issues, the capacity for penetrating insight and intelligent judgment, and sophisticated thinking and language abilities. These goals of advanced education have remained remarkably similar for several thousand years. In ancient Greece, most advanced students studied philosophy in order to achieve "wisdom." (The term *philosophy* in Greek means "lover of wisdom.") In today's world, many college students are hoping through their studies to become the modern-day equivalent: informed, *critical thinkers*.

The word *critical* comes from the Greek word for "critic" (*kritikos*), which means to question, to make sense of, to be able to analyze. It is by questioning, making sense of situations, and analyzing issues that we examine our thinking and the thinking of others. These critical activities aid us in reaching the best possible conclusions and decisions. The word *critical* is also related to the word *criticize*, which means to question and evaluate. Unfortunately, the ability to criticize is often only used destructively, to tear down someone else's thinking. Criticism, however, can also be *constructive*—analyzing for the purpose of developing a better understanding of what is going on. We will engage in constructive criticism as we develop our ability to think critically.

Thinking is the way you make sense of the world; thinking critically is thinking *about* your thinking so that you can clarify and improve it. If you can understand the way your mind works when you work toward your goals, make informed decisions, and analyze complex issues, then you can learn to think more effectively in these situations. In this chapter you will explore ways to examine your thinking so that you can develop it to the fullest extent possible. That is, you will discover how to *think critically*.

Becoming a critical thinker transforms you in positive ways by enabling you to become an expert learner, view the world clearly, and make productive choices as you shape your life. Critical thinking is not simply one way of thinking; it is a total approach to understanding how you make sense of a world that includes many parts. This chapter explores the various activities that make up thinking critically, including the following:

THINKING CRITICALLY Making sense of the world by carefully examining the thinking process to clarify and improve our understanding.

- ▶ Thinking actively
- ▶ Carefully exploring situations with questions
- ▶ Thinking independently
- ▶ Viewing situations from different perspectives
- ▶ Supporting diverse perspectives with evidence and reasons
- ▶ Discussing ideas in an organized way

Fulfilling Your Potential

It is essential to become a critical thinker in order to fulfill your human potential and live a meaningful life. Everybody “thinks”—*Homo sapiens* means “thinking man”—but most people don’t “think” very well. The purpose of this book is to help you reach your full thinking potential. This kind of transformational process is possible because the thinking process is such an integral part of who we are. When we expand our thinking, we expand who we are as human beings, the perspective from which we view the world, and the concepts and values we use to guide our choices. By exploring your thinking process and using it in carefully designed activities, you can develop it into a powerful, sophisticated tool that will enrich all dimensions of your life.

We each long for a life of significance, to feel that in some important way our own life has made a unique contribution to the world and to the lives of others. We each strive to create our self as a person of unusual quality, someone who is admired by others as extraordinary. We hope for lives characterized by accomplishments and lasting relationships that will distinguish us as memorable individuals both during and after our time on earth. Unfortunately, we often don’t achieve these lofty goals. In order to discover the meaning of our lives, we need to understand “who” we are. And we live in an age in which many people are not sure “who” they are or whether in fact their lives have *any* significant meaning.

When we are asked questions such as “Who are you?” or “What is the meaning of your life?” we often have no idea of how to respond. But an even more revealing symptom of our confusion and alienation is the fact that we rarely even pose these questions—to ourselves or to others. We are too busy “living” to wonder *why* we are living or who is actually doing the living. But can we afford to be too busy to find meaning in our lives? We so often cruise along on autopilot—days slipping into weeks, weeks merging into years, years coalescing into a life—without confronting these important questions. If we are to become human in the fullest sense, achieving our distinctive potentials and living lives of significance, we must become thoughtful and reflective critical thinkers.

This book is designed to provide the knowledge, guidance, and practice needed to elevate your thinking abilities to an optimal level. As a natural result of improving your thinking abilities, you will enrich the quality of your life and who you are as a human being. In our present culture, we spend a great deal of time, money, and effort seeking to improve our health, condition our bodies, and better our personal appearance. Too often neglected is the most important ingredient: the core of who we are—our ability to think and reflect, to understand our past and create our futures. We must restructure the way that we *think* in order to reshape the way that we *are*. Each of us strives for a life of purpose. Such lives are within our grasp, but to achieve them, we must harness the power of our minds by becoming enlightened critical thinkers.

Thinking Actively

When you think critically, you are *actively* using your intelligence, knowledge, and abilities to deal effectively with life’s situations. When you think actively, you are

- ▶ *Getting involved* in potentially useful projects and activities instead of remaining disengaged
- ▶ *Taking initiative* in making decisions on your own instead of waiting passively to be told what to think or do
- ▶ *Following through* on your commitments instead of giving up when you encounter difficulties
- ▶ *Taking responsibility* for the consequences of your decisions rather than unjustifiably blaming others or events “beyond your control”

When you think actively, you are not just waiting for something to happen. You are engaged in the process of achieving goals, making decisions, and solving problems. When you react passively, you let events control you or permit others to do your thinking for you. To make an intelligent decision about your future career, for example, you have to work actively to secure more information, try out various possibilities, speak with people who are experienced in your area of interest, and then critically reflect on all these factors. Thinking critically requires that you think actively—not react passively—to deal effectively with life’s situations.

Influences on Your Thinking

As our minds grow and develop, we are exposed to influences that encourage us to think actively. We also, however, have many experiences that encourage us to think passively. For example, some analysts believe that when people, especially children, spend much of their time watching television, they are being influenced to think passively, thus inhibiting their intellectual growth. Listed here are some of the influences we experience in our lives along with space for you to add your own influences. As you read through the list, place an *A* next to those items you believe in general influence you to think *actively*, and a *P* next to those you consider to be generally *passive* influences.

Activities:

- Reading books
- Writing
- Watching television
- Dancing
- Drawing/painting
- Playing video games
- Playing sports
- Listening to music

People:

- Family members
- Friends
- Employers
- Advertisers
- School/college teachers
- Police officers
- Religious leaders
- Politicians

Thinking Activity 5.1 *Influences on Our Thinking*

All of us are subject to powerful influences on our thinking, influences that we are often unaware of. For example, advertisers spend billions of dollars to manipulate our thinking in ways that are complex and subtle. For this exercise, choose one of the following tasks:

1. Watch some typical commercials, with several other class members if possible, and discuss with other watchers the techniques each advertiser is using to shape your thinking. Analyze with the other viewers how each of the elements in a commercial—images, language, music—affects an audience. Pay particular attention to the symbolic associations of various images and words, and identify the powerful emotions that these associations elicit. Why are the commercials effective? What influential roles do commercials play in our culture as a whole? For instance, think about how the impact of Nike commercials extends far beyond merely selling athletic shoes and sportswear to creating idealized images that people strive to emulate.
2. Select a Web site that uses advertisements and do an in-depth analysis of it. Explain how each of the site's elements—design, content, use of advertisements, links—works to influence our thinking. Pay particular attention to the advertisements: Are they static or flashing (in the same place, but changing every few minutes)? If you are observing a changing advertisement, monitor it for an hour or two and see how often it changes and who the advertisers are. What does this tell you about the site and the creators of the site?

Of course, in many cases people and activities can act as both active and passive influences, depending on the specifics of situations and our individual responses. For example, consider employers. If we are performing a routine, repetitive job, as I did during the summer I spent in a peanut butter cracker factory hand-scooping 2,000 pounds of peanut butter a day, the very nature of the work tends to encourage passive, uncreative thinking (although it might also lead to creative daydreaming!). We are also influenced to think passively if our employer gives us detailed instructions for performing every task, instructions that permit no exception or deviation. On the other hand, when our employer gives us general areas of responsibility within which we are expected to make thoughtful and creative decisions, then we are being stimulated to think actively and independently.

These contrasting styles of supervision are mirrored in different approaches to raising children. Some parents encourage children to be active thinkers by teaching them to express themselves clearly, make independent decisions, look at different points of view, and choose what they think is right for themselves. Other parents influence their children to be passive thinkers by not letting them do things on their own. These parents give the children detailed instructions they are expected to follow without question and make the important decisions for them. They are reluctant to give their children significant responsibilities, creating, unintentionally, dependent thinkers who are not well adapted to making independent decisions and assuming responsibility for their lives.

Becoming an Active Learner

Critical thinkers actively use their intelligence, knowledge, and abilities to deal with life's situations. Similarly, active thinking is one of the keys to effective learning. Each of us has our own knowledge framework that we use to make sense of the world, a framework that incorporates all that we have learned in our lives. When we

learn something new, we have to find ways to integrate this new information or skill into our existing knowledge framework. For example, if one of your professors is presenting material on Sigmund Freud's concept of the unconscious or the role of Heisenberg's uncertainty principle in the theory of quantum mechanics, you need to find ways to relate these new ideas to things you already know in order to make this new information "your own." How do you do this? By actively using your mind to integrate new information into your existing knowledge framework, thereby expanding the framework to include this new information.

For example, when your professor provides a detailed analysis of Freud's concept of the unconscious, you use your mind to call up what you know about Freud's theory of personality and what you know of the concept of the unconscious. You then try to connect this new information to what you already know, integrating it into your expanding knowledge framework. In a way, learning is analogous to the activity of eating: you ingest food (*information*) in one form, actively transform it through digestion (*mental processing*), and then integrate the result into the ongoing functioning of your body.

Carefully Exploring Situations with Questions

As you have just seen, thinking critically involves actively using your thinking abilities to attack problems, meet challenges, and analyze issues. An important dimension of thinking actively is carefully exploring the situations in which you are involved with relevant questions. In fact, the ability to ask appropriate and penetrating questions is one of the most powerful thinking tools you possess, although many people do not make full use of it. Active learners explore the learning situations they are involved in with questions that enable them to understand the material or task at hand, and then integrate this new understanding into their knowledge framework. In contrast, passive learners rarely ask questions. Instead, they try to absorb information like sponges, memorizing what is expected and then regurgitating what they memorized on tests and quizzes.

Questions come in many different forms and are used for a variety of purposes. For instance, questions can be classified in terms of the ways that people organize and interpret information, and we can identify six such categories of questions:

- | | |
|-------------------|----------------|
| 1. Fact | 4. Synthesis |
| 2. Interpretation | 5. Evaluation |
| 3. Analysis | 6. Application |

Active learners are able to ask appropriate questions from all of these categories in a very natural and flexible way. These various types of questions are closely interrelated, and an effective thinker is able to use them in a productive relation to one another. Also, these categories of questions are very general and at times overlap with one another. This means that a given question may fall into more than one of the six categories of questions. Following is a summary of the six categories of questions along with sample forms of questions from each category.

1. *Questions of Fact:* Questions of fact seek to determine the basic information of a situation: who, what, when, where, how. These questions seek information that is relatively straightforward and objective.

Who, what, when, where, how _____?

Describe _____.

2. *Questions of Interpretation:* Questions of interpretation seek to select and organize facts and ideas, discovering the relationships between them. Examples of such relationships include the following:

- ▶ *Chronological relationships*: relating things in time sequence
- ▶ *Process relationships*: relating aspects of growth, development, or change
- ▶ *Comparison/contrast relationships*: relating things in terms of their similar/different features
- ▶ *Causal relationships*: relating events in terms of the way some events are responsible for bringing about other events

Retell _____ in your own words.

What is the *main idea* of _____?

What is the *time sequence* relating the following even: _____?

What are the steps in the *process of growth or development* in _____?

How would you *compare and contrast* _____ and _____?

What was the *cause* of _____? The *effect* of _____?

3. *Questions of Analysis*: Questions of analysis seek to separate an entire process or situation into its component parts and to understand the relation of these parts to the whole. These questions attempt to classify various elements, outline component structures, articulate various possibilities, and clarify the reasoning being presented.

What are the *parts or features* of _____?

Classify _____ according to _____.

Outline/diagram/web _____.

What *evidence* can you present to support _____?

What are the *possible alternatives* for _____?

Explain the *reasons why* you think _____.

4. *Questions of Synthesis*: Questions of synthesis have as their goal combining ideas to form a new whole or come to a conclusion, making inferences about future events, creating solutions, and designing plans of action.

What would you *predict/infer* from _____?

What ideas can you *add to* _____?

How would you *create/design* a new _____?

What might happen if you *combined* _____ with _____?

What *solutions/decisions* would you suggest for _____?

5. *Questions of Evaluation*: The aim of evaluation questions is to help us make informed judgments and decisions by determining the relative value, truth, or reliability of things. The process of evaluation involves identifying the criteria or standards we are using and then determining to what extent the things in common meet those standards.

How would you *evaluate* _____, and what *standards* would you use?

Do you agree with _____? Why or why not _____?

How would you *decide* about _____?

What *criteria* would you use to *assess* _____?

6. *Questions of Application:* The aim of application questions is to help us take the knowledge or concepts we have gained in one situation and apply them to other situations.

How is _____ an example of _____?

How would you *apply* this rule/principle to _____?

Mastering these forms of questions and using them appropriately will serve you as powerful tools in the learning process.

Becoming an expert questioner is an ongoing project, and you can practice it throughout the day. When you are talking to people about even everyday topics, get in the habit of asking questions from all of the different categories. Similarly, when you are attending class, taking notes, or reading assignments, make a practice of asking—and trying to answer—appropriate questions. You will find that by actively exploring the world in this way you are discovering a great deal and learning what you have discovered in a meaningful and lasting fashion.

As children, we were natural questioners, but this questioning attitude was often discouraged when we entered the school system. Often we were given the message, in subtle and not so subtle ways, that “schools have the questions; your job is to learn the answers.” The educator Neil Postman has said: “Children enter schools as question marks and they leave as periods.” In order for us to become critical thinkers and effective learners, we have to become question marks again.

Thinking Activity 5.2

Analyzing a Complex Issue

Review the following decision-making situation (based on an incident that happened in Springfield, Missouri, in 1989), and then critically examine it by posing questions from each of the six categories we have considered in this section:

- | | |
|-------------------|----------------|
| 1. Fact | 4. Synthesis |
| 2. Interpretation | 5. Evaluation |
| 3. Analysis | 6. Application |

Imagine that you are a member of a student group at your college that has decided to stage the controversial play *The Normal Heart* by Larry Kramer. The play is based on the lives of real people and dramatizes their experiences in the early stages of the AIDS epidemic. It focuses on their efforts to publicize the horrific nature of this disease and to secure funding from a reluctant federal government to find a cure. The play is considered controversial because of its exclusive focus on the subject of AIDS, its explicit homosexual themes, and the large amount of profanity contained in the script. After lengthy discussion, however, your student group has decided that the educational and moral benefits of the play render it a valuable contribution to the life of the college.

While the play is in rehearsal, a local politician seizes upon it as an issue and mounts a political and public relations campaign against it. She distributes selected excerpts of the play to newspapers, religious groups, and civic organizations. She also introduces a bill in the state legislature to withdraw state funding for the college if the play is performed. The play creates a firestorm of controversy, replete with local and national news reports, editorials, and impassioned speeches for and against it. Everyone associated with the play is subjected to verbal harassment, threats, crank phone calls, and hate mail. The firestorm explodes when the house of one of the key

spokespersons for the play is burned to the ground. The director and actors go into hiding for their safety, rehearsing in secret and moving from hotel to hotel.

Your student group has just convened to decide what course of action to take. Analyze the situation using the six types of questions listed previously and then conclude with your decision and the reasons that support your decision.

Thinking Independently

Answer the following questions, based on what you believe to be true.

	Yes	No	Not Sure
1. Is the earth flat?			
2. Is there a God?			
3. Is abortion wrong?			
4. Have alien life forms visited the earth?			
5. Should men be the breadwinners and women the homemakers?			

Your responses to these questions reveal aspects of the way your mind works. How did you arrive at these conclusions? Your views on these and many other issues probably had their beginnings with your family, especially your parents. When we are young, we are very dependent on our parents, and we are influenced by the way they see the world. As we grow up, we learn how to think, feel, and behave in various situations. In addition to our parents, our “teachers” include our brothers and sisters, friends, religious leaders, schoolteachers, books, television, and so on. Most of what we learn we absorb without even being aware of the process. Many of your ideas about the issues raised in the preceding questions were most likely shaped by the experiences you had growing up.

As a result of our ongoing experiences, however, our minds—and our thinking—continue to mature. Instead of simply accepting the views of others, we gradually develop the ability to examine this thinking and to decide whether it makes sense to us and whether we should accept it. As we think through such ideas, we use this standard to make our decisions: Are there good reasons or evidence that support this thinking? If there are good reasons, we can actively decide to adopt these ideas. If they do not make sense, we can modify or reject them.

Of course, we do not *always* examine our own thinking or the thinking of others so carefully. In fact, we very often continue to believe the same ideas we were brought up with, without ever examining and deciding for ourselves what to think. Or we often blindly reject the beliefs we have been brought up with, without really examining them.

How do you know when you have examined and adopted ideas yourself instead of simply borrowing them from others? One indication of having thought through your ideas is being able to explain *why* you believe them, explaining the reasons that led you to these conclusions.

For each of the views you expressed at the beginning of this section, explain how you arrived at it and give the reasons and evidence that you believe support it.

1. *Example:* Is the earth flat?

Explanation: I was taught by my parents and in school that the earth was round.

Reasons/Evidence:

a. *Authorities:* My parents and teachers taught me this.

- b. *References*: I read about this in science textbooks.
 - c. *Factual evidence*: I have seen a sequence of photographs taken from outer space that show the earth as a globe.
 - d. *Personal experience*: When I flew across the country, I could see the horizon line changing.
- 2. Is there a God?
 - 3. Is abortion wrong?
 - 4. Have alien life forms visited the earth?
 - 5. Should men be the breadwinners and women the homemakers?

Of course, not all reasons and evidence are equally strong or accurate. For example, before the fifteenth century the common belief that the earth was flat was supported by the following reasons and evidence:

- ▶ *Authorities*: Educational and religious authorities taught people the earth was flat.
- ▶ *References*: The written opinions of scientific experts supported belief in a flat earth.
- ▶ *Factual evidence*: No person had ever circumnavigated the earth.
- ▶ *Personal experience*: From a normal vantage point, the earth *looks* flat.

Many considerations go into evaluating the strengths and accuracy of reasons and evidence, and we will be exploring these areas in this and future chapters. Let's examine some basic questions that critical thinkers automatically consider when evaluating reasons and evidence by completing Thinking Activity 5.3.

Thinking Activity 5.3

Evaluating Your Beliefs

Evaluate the strengths and accuracy of the reasons and evidence you identified to support your beliefs on the five issues by addressing questions such as the following

- ▶ *Authorities*: Are the authorities knowledgeable in this area? Are they reliable? Have they ever given inaccurate information? Do other authorities disagree with them?
 - ▶ *References*: What are the credentials of the authors? Are there other authors who disagree with their opinions? On what reasons and evidence do the authors base their opinions?
 - ▶ *Factual evidence*: What are the source and foundation of the evidence? Can the evidence be interpreted differently? Does the evidence support the conclusion?
 - ▶ *Personal experience*: What were the circumstances under which the experiences took place? Were distortions or mistakes in perception possible? Have other people had either similar or conflicting experiences? Are there other explanations for the experience?
-

Thinking for yourself doesn't always mean doing exactly what you want to; it may mean becoming aware of the social guidelines and expectations of a given situation and then making an informed decision about what is in your best interests. For example, even though you may have a legal right to choose whatever clothes you want to wear at your workplace, if your choice doesn't conform to your employer's guidelines or "norms," then you may suffer unpleasant consequences as a result. In other words, thinking for yourself often involves balancing your view of things against those of others, integrating yourself into social structures without sacrificing your independence or personal autonomy.

Learning to become an independent, critical thinker is a complex, ongoing process that involves all the abilities we have been examining in this chapter up to this point:

- Thinking actively
- Carefully exploring situations with questions
- Thinking independently

As you confront the many decisions you have to make in your life, you should try to gather all the relevant information, review your priorities, and then carefully weigh all the factors before arriving at a final decision. One helpful strategy for exploring thinking situations is the one we have been practicing: *identify* the important questions that need to be answered and then try to answer these questions.

Looking Critically @ Evaluating Internet Information

The information "superhighway" of the Internet is an incredibly rich source of information on virtually every subject that exists. But it's important to remember that information is not knowledge. Information doesn't become *knowledge* until we think critically about it. As a critical thinker, you should never accept information at face value without first establishing its accuracy, evaluating the credibility of the source, and determining the point of view or bias of the source. These are issues that we will explore throughout this book, but for now you can use the following checklist to evaluate the information on the Internet—and other sources as well.

✓ Checklist Evaluating the Quality of Internet Resources

Criterion 1: Authority

- ☒ Is it clear who sponsors the page and what the sponsor's purpose in maintaining the page is?
- ☒ Is it clear who wrote the material and what the author's qualifications for writing on this topic are?
- ☒ Is there a way of verifying the legitimacy of the page's sponsor; that is, is there a phone number or postal address to contact for more information? (Simply an e-mail address is not enough.)
- ☒ If the material is protected by copyright, is the name of the copyright holder given?

Criterion 2: Accuracy

- ☒ Are the sources for any factual information clearly listed so they can be verified in another source?
- ☒ Has the sponsor provided a link to outside sources (such as product reviews or reports filed with the SEC) that can be used to verify the sponsor's claims?
- ☒ Is the information free of grammatical, spelling, and other typographical errors? (These kinds of errors not only indicate a lack of quality control but can actually produce inaccuracies in information.)
- ☒ Is statistical data in graphs and charts clearly labeled and easy to read?
- ☒ Does anyone monitor the accuracy of the information being published?

Criterion 3: Objectivity

- ☒ For any given piece of information, is it clear what the sponsor's motivation is for providing it?
- ☒ Is the information content clearly separated from any advertising or opinion content?
- ☒ Is the point of view of the sponsor presented in a clear manner, with its arguments well supported?

- ☒ Are there any other indications that the material is kept current?
- ☒ If material is presented in graphs or charts, is it clearly stated when the data was gathered?
- ☒ Is there an indication that the page has been completed and is not still in the process of being developed?

Criterion 4: Currentness

- ☒ Are there dates on the page to indicate when the page was written, first placed on the Web, and last revised?

Source: This material was compiled from a set of five checklists created by Jan Alexander and Marsha Tate, "Teaching Critical Evaluation Skills for World Wide Web Resources," 28 Oct. 1996. <http://www.widener.edu/libraries.html>. (Select link "Evaluating Web Resources.") Reprinted from *Computers in Libraries*, courtesy of Information Today, Inc., Medford, New Jersey.

After you have read through the checklist, log onto any Web site—either one you're already familiar with or one you've never visited before—and evaluate it by answering the questions in the checklist. Record your answers and then discuss your evaluation with other class members.

Viewing Situations from Different Perspectives

Although it is important to think for yourself, others may have good ideas from which you can learn and benefit. A critical thinker is a person who is willing to listen to and examine carefully other views and new ideas. In addition to your viewpoint, there may be other viewpoints that are equally important and need to be taken into consideration if you are to develop a more complete understanding of a situation.

As children we understand the world from only our own point of view. As we grow, we come into contact with people who have different viewpoints and begin to realize that our viewpoint is often inadequate, we are frequently mistaken, and our perspective is only one of many. If we are going to learn and develop, we must try to understand and appreciate the viewpoints of others. For example, consider the following situation:

Imagine that you have been employed at a new job for the past six months. Although you enjoy the challenge of your responsibilities and you are performing well, you find that you simply cannot complete all your work during office hours. To keep up, you have to work late, take work home, and even occasionally work on weekends. When you explain this to your employer, she says that although she is sorry that the job interferes with your personal life, it has to be done. She suggests that you view these sacrifices as an investment in your future and that you should try to work more efficiently. She reminds you that there are many people who would be happy to have your position.

1. Describe this situation from your employer's standpoint, identifying reasons that might support her views.
2. Describe some different approaches that you and your employer might take to help resolve this situation.

For most of the important issues and problems in your life, one viewpoint is simply not adequate to provide a full and satisfactory understanding. To increase and deepen your knowledge, you must seek *other perspectives* on the situations you are trying to understand. You can sometimes accomplish this by using your imagination to visualize other viewpoints. Usually, however, you need to seek actively (and *listen* to) the viewpoints of others. It is often very difficult for people to see things from points of view other than their own, and if you are not careful, you can make the very serious mistake of thinking that the way you see things is the way things really are. In addition to identifying with perspectives other than your own, you also have to work to understand the *reasons* that support these alternate viewpoints. This approach deepens your understanding of the issues and also stimulates you to evaluate critically your beliefs.

Thinking Activity 5.4

Analyzing a Belief from Different Perspectives

Describe a belief of yours about which you feel very strongly. Then explain the reasons or experiences that led you to this belief.

Next, describe a point of view that is *different* from your belief. Identify some of the reasons that someone might hold this belief. A student example follows.

A Belief That I Feel Strongly About

I used to think that we should always try everything in our power to keep a person alive. But now I strongly believe that a person has a right to die in peace and with dignity. The reason why I believe this now is because of my father's illness and death.

It all started on Christmas Day, December 25, when my father was admitted to the hospital. The doctor's diagnosed his condition as a heart attack. Following this episode, he was readmitted and discharged from several different hospitals. On June 18, he was hospitalized for what was initially thought to be pneumonia but which turned out to be lung cancer. He began chemotherapy treatments. When complications occurred, he had to be placed on a respirator. At first he couldn't speak or eat. But then they operated on him and placed the tube from the machine in his throat instead of his mouth. He was then able to eat and move his mouth. He underwent radiation therapy when they discovered he had three tumors in his head and that the cancer had spread all over his body. We had to sign a paper which asked us to indicate, if he should stop breathing, whether we would want the hospital to try to revive him or just let him go. We decided to let him go because the doctors couldn't guarantee that he wouldn't become brain-dead. At first they said that there was a forty percent chance that he would get off the machine. But instead of that happening, the percentage went down.

It was hard seeing him like that since I was so close to him. But it was even harder when he didn't want to see me. He said that by seeing me suffer, his suffering was greater. So I had to cut down on seeing him. Everybody that visited him said that he had changed dramatically. They couldn't even recognize him.

The last two days of his life were the worst. I prayed that God would relieve him of his misery. I had come very close to taking him off the machine in order for him not to suffer, but I didn't. Finally he passed away on November 22, with not the least bit of

peace or dignity. The loss was great then and still is, but at least he's not suffering. That's why I believe that when people have terminal diseases with no hope of recovery, they shouldn't place them on machines to prolong their lives of suffering, but instead they should be permitted to die with as much peace and dignity possible.

Somebody else might believe very strongly that we should try everything in our power to keep people alive. It doesn't matter what kind of illness or disease the people have. What's important is that they are kept alive, especially if they are loved ones. Some people want to keep their loved ones alive with them as long as they can, even if it's by a machine. They also believe it is up to God and medical science to determine whether people should live or die. Sometimes doctors give them hope that their loved ones will recover, and many people wish for a miracle to happen. With these hopes and wishes in mind, they wait and try everything in order to prolong a life, even if the doctors tell them that there is nothing that can be done.

Being open to new ideas and different viewpoints means being *flexible* enough to change or modify your ideas in the light of new information or better insight. Each of us has a tendency to cling to the beliefs we have been brought up with and the conclusions we have arrived at. If we are going to continue to grow and develop as thinkers, however, we have to be willing to change or modify our beliefs when evidence suggests that we should. For example, imagine that you have been brought up with certain views concerning an ethnic group—African American, Caucasian, Hispanic, Asian, Native American, or any other. As you mature and your experience increases, you may find that the evidence of your experience conflicts with the views you have been raised with. As critical thinkers, we have to be *open* to receiving this new evidence and *flexible* enough to change and modify our ideas on the basis of it.

In contrast to open and flexible thinking, *uncritical* thinking tends to be one-sided and close-minded. People who think this way are convinced that they alone see things as they really are and that everyone who disagrees with them is wrong. The words we use to describe this type of person include “dogmatic,” “subjective,” and “egocentric.” It is very difficult for such people to step outside their own viewpoints in order to see things from other people's perspectives. Part of being an educated person is being able to think in an open-minded and flexible way.

Supporting Diverse Perspectives with Reasons and Evidence

When you are thinking critically, what you think makes sense, and you can give good reasons to back up your ideas. As we have seen and will continue to see throughout this book, it is not enough simply to take a position on an issue or make a claim; we have to *back up our views* with other information that we feel supports our position. In other words, there is an important distinction as well as relationship between *what* you believe and *why* you believe it.

If someone questions *why* you see an issue the way you do, you probably respond by giving reasons or arguments you feel support your belief. For example, take the question of what sort of college to attend: two-year or four-year, residential or commuting. What are some of the reasons you might offer to support your decision to attend the kind of college in which you enrolled?

Although all the reasons you just gave for attending your sort of college support your decision, some are obviously more important to you than others. In any case, even though going to your college may be the right thing for you to do, this decision does not mean that it is the right thing for everyone to do. In order for you to fully appreciate this fact, to see both sides of the issue, you have to put yourself in the position of others and try to see things from their points of view. What are some of the reasons or arguments someone might give for attending a different kind of college?

The responses you just gave demonstrate that, if you are interested in seeing all sides of an issue, you have to be able to give supporting reasons and evidence not just for *your* views, but for the views of *others* as well. Seeing all sides of an issue thus combines these two critical thinking abilities:

- Viewing issues from different perspectives
- Supporting diverse viewpoints with reasons and evidence

Combining these two abilities enables you not only to understand other views about an issue, but also to understand *why* these views are held. Consider the issue of whether seat-belt use should be mandatory. As you try to make sense of this issue, you should attempt to identify not just the reasons that support your view, but also the reasons that support other views. The following are reasons that support each view of this issue.

Issue:

Seat-belt use should be mandatory.

Seat-belt use should not be mandatory.

Supporting Reasons:

1. Studies show that seat belts save lives and reduce injury in accidents.

Supporting Reasons

1. Many people feel that seat belts may trap them in a burning vehicle.

Now see if you can identify additional supporting reasons for each of these views on making use of seat belts mandatory.

Supporting Reasons:

- 2.
- 3.
- 4.

Supporting Reasons:

- 2.
- 3.
- 4.

Thinking Activity 5.5

Analyzing Different Sides of an Issue

For each of the following issues, identify reasons that support each side of the issue.

Issue:

1. Multiple-choice and true/false exams should be given in college-level courses.

Multiple-choice and true/false exams should not be given in college-level courses.

Issue:

2. Immigration quotas should be reduced.

Immigration quotas should be increased.

Issue:

3. The best way to deal with crime is to give long prison sentences.

Long prison sentences will not reduce crime.

Issue:

4. When a couple divorces, the children should choose the parent with whom they wish to live.

When a couple divorces, the court should decide all custody issues regarding the children.

Thinking Activity 5.6

Analyzing Different Perspectives

Working to see different perspectives is crucial in helping you get a more complete understanding of the ideas being expressed in the passages you are reading. Read each of the following passages and then do the following:

1. Identify the main idea of the passage.
2. List the reasons that support the main idea.
3. Develop another view of the main issue.
4. List the reasons that support the other view.

► Most wicked deeds are done because the doer proposes some good to himself. The liar lies to gain some end; the swindler and thief want things which, if honestly got, might be good in themselves. Even the murderer may be removing an impediment to normal desires or gaining possession of something which his victim keeps from him. None of these people usually does evil for evil's sake. They are selfish or unscrupulous, but their deeds are not gratuitously evil. The killer for sport has no such comprehensible motive. He prefers death to life, darkness to light. He gets nothing except the satisfaction of saying, "Something which wanted to live is dead. There is that much less vitality, consciousness, and, perhaps, joy in the universe. I am the Spirit that Denies." When a human wantonly destroys one of humankind's own works we call him Vandal. When he wantonly destroys one of the works of God we call him Sportsman.

► More than at any other time in history, America is plagued by the influence of cults, exclusive groups that present themselves as religions devoted to the worship of a single individual. Initially, most Americans were not terribly concerned with the growth of cults, but then in 1979, more than nine hundred cult members were senselessly slaughtered in the steamy jungles of a small South American country called Guyana. The reason for the slaughter was little more than the wild, paranoid fear of the leader, the Reverend Jim Jones, who called himself father and savior. Since that time, evidence has increased that another cult leader, the Reverend Sun Myung Moon, has amassed a large personal fortune from the purses of his followers, male and female "Moonies," who talk of bliss while peddling pins and emblems preaching the gospel of Moon. Cults, with their hypnotic rituals and their promises of ecstasy, are a threat to American youth, and it is time to implement laws that would allow for a thorough restriction of their movements.

Discussing Ideas in an Organized Way

Thinking critically often takes place in a social context, not in isolation. Although it is natural for every person to have his or her own perspective on the world, no single viewpoint is adequate for making sense of complex issues, situations, or even people. As we will see in the chapters ahead, we each have our own “lenses” through which we view the world—filters that shape, influence, and often distort the way we see things. The best way to expand one’s thinking and compensate for the bias that we all have is to discuss our experiences with other people.

This is the way in which thinking develops: being open to the viewpoints of others and being willing to listen and to exchange ideas with them. This process of give-and-take, of advancing our views and considering those of others, is known as *discussion*. When we participate in a discussion, we are not simply talking; we are exchanging and exploring our ideas in an organized way.

Unfortunately, our conversations with other people about important topics are too often not productive exchanges. They often degenerate into name calling, shouting matches, or worse. Consider the following dialogue:

Person A: I have a friend who just found out that she’s pregnant and is trying to decide whether she should have an abortion or have the baby. What do you think?

Person B: Well, I think that having an abortion is murder. Your friend doesn’t want to be a murderer, does she?

Person A: How can you call her a murderer? An abortion is a medical operation.

Person B: Abortion *is* murder. It’s killing another human being, and your friend doesn’t have the right to do that.

Person A: Well, you don’t have the right to tell her what to do—it’s her body and her decision. Nobody should be forced to have a child that is not wanted.

Person B: Nobody has the right to commit murder—that’s the law.

Person A: But abortion isn’t murder.

Person B: Yes, it is.

Person A: No, it isn’t.

Person B: Good-bye! I can’t talk to anyone who defends murderers.

Person A: And I can’t talk to anyone who tries to tell other people how to run their lives.

If we examine the dynamics of this dialogue, we can see that the two people here are not really

- ▶ Listening to each other
- ▶ Supporting their views with reasons and evidence
- ▶ Responding to the points being made
- ▶ Asking—and trying to answer—important questions
- ▶ Trying to increase their understanding rather than simply winning the argument

In short, the people in this exchange are not *discussing* their views; they are simply *expressing* them, and each is trying to influence the other person into agreeing. Contrast this first dialogue with the following one. Although it begins the same way, it quickly takes a much different direction.

Person A: I have a friend who just found out that she’s pregnant and is trying to decide whether she should have an abortion or have the baby. What do you think?

Person B: Well, I think that having an abortion is murder. Your friend doesn’t want to be a murderer, does she?

Person A: Of course she doesn't want to be a murderer! But why do you believe that having an abortion is the same thing as murder?

Person B: Because murder is when we kill another human being, and when you have an abortion, you are killing another human being.

Person A: But is a fetus a human being yet? It certainly is when it is born. But what about before it's born, while it's still in the mother's womb? Is it a person then?

Person B: I think it is. Simply because the fetus hasn't been born doesn't mean that it isn't a person. Remember, sometimes babies are born prematurely, in their eighth or even seventh month of development. And they go on to have happy and useful lives.

Person A: I can see why you think that a fetus in the *last stages* of development—the seventh, eighth, or ninth month—is a person. After all, it can survive outside the womb with special help at the hospital. But what about at the *beginning* of development? Human life begins when an egg is fertilized by a sperm. Do you believe that the fertilized egg is a person?

Person B: Let me think about that for a minute. No, I don't think that a fertilized egg is a person, although many people do. I think that a fertilized egg has the *potential* to become a person—but it isn't a person yet.

Person A: Then at what point in its development do you think a fetus *does* become a person?

Person B: That's a good question, one that I haven't really thought about. I guess you could say that a fetus becomes a person when it begins to look like a person, with a head, hands, feet, and so on. Or you might say that a fetus becomes a person when all of its organs are formed—liver, kidneys, lungs, and so on. Or you might say that it becomes a person when its heart begins to start beating or when its brain is fully developed. Or you might say that its life begins when it can survive outside the mother. I guess determining when the fetus becomes a person all depends on the *standard* that you use.

Person A: I see what you're saying! Since the development of human life is a continuous process that begins with a fertilized egg and ends with a baby, deciding when the fetus becomes a person depends on at what point in the process of development you decide to draw the line. But *how* do you decide where to draw the line?

Person B: That's a good place to begin another discussion. But right now I have to leave for class. See you later.

How would you contrast the level of communication taking place in this dialogue with that in the first dialogue? What are the reasons for your conclusion?

Naturally, discussions are not always quite this organized and direct. Nevertheless, this second dialogue does provide a good model for what can take place in our everyday lives when we carefully explore an issue or a situation with someone else. Let us take a closer look at this discussion process.

Listening Carefully

Review the second dialogue and notice how each person in the discussion *listens carefully* to what the other person is saying and then tries to comment directly on what has just been said. When you are working hard at listening to others, you are trying to understand the point they are making and the reasons for it. This enables you to imagine yourself in their position and see things as they see them. Listening in this way often brings new ideas and different ways of viewing the situation to your attention that might never have occurred to you. An effective dialogue in this sense is like a game of tennis—you hit the ball to me, I return the ball back to you, you return my return, and so on. The “ball” the discussants keep hitting back and forth is the subject they are gradually analyzing and exploring.

Supporting Views with Reasons and Evidence

Critical thinkers support their points of view with evidence and reasons and also develop an in-depth understanding of the evidence and reasons that support other viewpoints. Review the second dialogue and identify some of the reasons used by the participants to support their points of view. For example, Person B expresses the view that “abortion is murder” and supports this view with the reasoning that “murder is killing another human being”; if a fetus is a human being, removing it from the womb prematurely is the same thing as murder.

Responding to the Points Being Made

When people engage in effective dialogue, they listen carefully to the people speaking and then respond directly to the points being made instead of simply trying to make their own points. In the second dialogue, Person A responds to Person B’s view that “abortion is murder” with the question “But is a fetus a human being yet?” When you respond directly to other people’s views, and they to yours, you extend and deepen the explorations into the issues being discussed. Although people involved in the discussion may not ultimately agree, they should develop a more insightful understanding of the important issues and a greater appreciation of other viewpoints. Examine the sample dialogue and notice how each person keeps responding to what the other is saying, creating an ongoing, interactive discussion.

Asking Questions

Asking questions is one of the driving forces in your discussions with others. You can explore a subject first by raising important questions and then by trying to answer them together. This questioning process gradually reveals the various reasons and evidence that support each of the different viewpoints involved. For example, although the two dialogues begin the same way, the second dialogue moves in a completely different direction from that of the first when Person A poses the question: “But *why* do you believe that having an abortion is the same thing as murder?” Asking this question directs the discussion toward a mutual exploration of the issues and away from angry confrontation. Identify some of the other key questions that are posed in the dialogue.

A guide to the various types of questions that can be posed in exploring issues and situations begins on page 00 of this chapter.

Increasing Understanding

When we discuss subjects with others, we often begin by disagreeing with them. In fact, this is one of the chief reasons that we have discussions. In an effective discussion, however, our main purpose should be to develop our understanding—not to prove ourselves right at any cost. If we are determined to prove that we are right, then we are likely not to be open to the ideas of others and to viewpoints that differ from our own.

Imagine that instead of ending, the second dialogue had continued for a while. Create responses that expand the exploration of the ideas being examined, and be sure to keep the following discussion guidelines in mind as you continue the dialogue.

- ▶ When we discuss, we have to listen to each other.
- ▶ When we discuss, we keep asking—and trying to answer—important questions.
- ▶ When we discuss, our main purpose is to develop a further understanding of the subject we are discussing, not to prove that we are right and the other person is wrong.

Person A: I see what you're saying! Since the development of human life is a continuous process that begins with a fertilized egg and ends with a baby, deciding when the fetus becomes a person depends on the point in the process of development at which you decide to draw the line. But *how* do you decide where to draw the line?

Etc.

Thinking Activity 5.7

Creating a Dialogue

Select an important social issue and write a dialogue that analyzes the issue from two different perspectives. As you write your dialogue, keep in mind the qualities of effective discussion: listening carefully to the other person and trying to comment directly on what has been said, asking and trying to answer important questions about the subject, and trying to develop a fuller understanding of the subject instead of simply trying to prove yourself right.

After completing your dialogue, read it to the class (with a classmate as a partner). Analyze the class's dialogues by using the criteria for effective discussions that we have examined.

Looking Critically @ Communicating on the Internet

"Since brevity is the soul of wit, and tediousness the limbs and outward flourishes,—I will be brief." So said William Shakespeare in *Hamlet* (II. ii. 90). It's very possible that he predicted the coming of the electronic age with its communication tools like email, instant messaging, chat groups, and message boards. The fewer words used to convey an idea, the faster the idea can be received by the audience. And speed is of the essence in the modern world.

Email (electronic mail, by definition) is generally composed of short writings that are to the point, without formalities, typed into a memo-like template, and sent out to one or many addresses via an Internet service. But you need to consider a few things before taking mouse in hand. What kind of "letter" are you composing (business or personal)? Who is the recipient (a friend, a schoolteacher, a prospective employer, a business)? What kind of service is going to "send" your email, and what kind of service does your reader use? Let's talk about why these points are important.

Because some carriers, for your safety and privacy, let you adopt a nom de plume (called a *screen name* in cyberspeak), it is important that you clearly identify yourself to the recipient—and in formal writings, that means including your full "real" name. Keep in mind that the appearance of email can vary, depending upon the capability of the carrier as well as the receiver's computer and printer. It is important that only basic "typing" be used—black text, Arial or another basic font, no bold, no underlining, no italics, no tables, no varying sizes of lettering. Features that you use to enhance an email may not "translate" over the airwaves to your reader and may actually garble your text. Also, be cautious about how and what you are trying to say: the "tone" of your thoughts may not be understood if you write casually. Use acronyms and symbols sparingly; not everyone has yet learned the language of cyberspace, and peppering your paragraphs with "smileys" (faces drawn with the alphabet:-) or ASCII art (pictures drawn with the letters and symbols of the keyboard) can look like gibberish to the uninitiated.

Why use email at all? It's fast, it saves you time (no more searching for postage stamps, envelopes, or paper), it lets people communicate at their own convenience (at 2 A.M. or 4 P.M.), and it's inexpensive (often just pennies for the cost of a local phone call). You can maintain a current, daily correspondence with your friends in Brazil, Germany, or next door without the worry of losing mail or the expense and chore of weighing packages and trekking to a post office. There is usually just a minimal time lag between the moment you press the Send button and the moment the recipient finds out she has "got mail."

For school and the workplace, email can be a savior. In addition to copying and pasting words into the email template, you can generally "attach" an electronic file (created in word processing or in a spreadsheet program, for example) as a tag along. This is a great way to hand in that term paper or take-home test, reply to a classified ad by sending your résumé to a prospective employer, or return a completed grant application. Be sure, however, to tell readers which software you used to create the attachment because they will have to use a compatible program to open the file. The days of "Please send your document by fax" are almost gone; today, everyone wants a copy of your "plain text" résumé via email. So be sure to lay it out simply, check the spelling and the syntax, and include a polite cover letter with your name, address, phone number, and any other ways the recruiter, company, school, or other person can contact you.

And what about **chat rooms**? As you may well know by now, *chat rooms*, *forums*, and *conference rooms* are means of communicating "live and in person" while signed onto an Internet service such as America Online. People with common interests (everything ranging from belonging to similar age groups to geography to hobbies) gather together in groups and "talk" to each other, generally with a "host" to introduce the "newbies" (newcomers), keep the chatter going, monitor the language, and ensure that behavior stays reasonable. The "room" display is set up much like a movie script, with a running dialogue shown along with the names of those people in the room and a space provided for you to type in a sentence or two and "send" your message to the room for viewing. In some cases, you can also initiate another feature called "Instant messaging" (IM) which allows you to send a quickly typed message to a friend whom you know is also online. You can then continue the conversation with only that person. Think of how much money you both can save on long distance phone charges if you both are only using a local phone call to connect to the Internet and "chat" with someone who lives far away!

Another interesting way to communicate on the Internet is to use **message** or **bulletin boards**. Much like the old-fashioned cork-board-and-paper notes you see in school or supermarket lobbies, these "boards" allow you to jot down a question or post a message and put it "out there" for the general public to see and respond to. Such message boards are often organized by topic, so you can find them by searching an online service's index. One of the largest is Usenet, a network of newsgroups or electronic bulletin boards accessible through the Internet. (A newsreader program needs to be installed on the local computer system in order to access Usenet.) Selling a car? Arranging a high school reunion? Looking for a recipe for cookies? Want to find roommates for a vacation time-share? Having problems with a software application? Moving to a new town and want to find out what community groups are there? Many bulletin boards allow the person responding to your posting to also select a "return by email" feature. So, aside from your getting a personal answer to your question, you can also "browse" these boards to see if other people have posted questions and/or answers that can help you. These boards can be a great learning and research tool for someone who is just beginning to explore cyberspace. There's nothing like the experience of others to help you with your daily grind!

Finally, there is the issue of **netiquette** (a new word coined from Internet and etiquette). As the electronic age expands throughout the world, rules seem to develop on their own to go along with this new means of communication. Typing in all capitals is considered RUDE and means you are SHOUTING. "Scrolling"—

typing the same thing over and over and over while in a chat room, thereby preventing others from “speaking” and making a nuisance of yourself—is also prohibited. Sending unsolicited mass mailings to people—called “spamming”—is a strict “no-no.” Chain letters are also frowned upon. Foul language, profanity, and generally crass and juvenile behavior can result in a person’s being temporarily cut off from an Internet service or even losing her online privileges permanently. Of course, anything illegal can even have the police knocking on your door. The Internet is a public space, and government regulation is only recently being developed to counter those who abuse the freedom of speech we cherish in our country. So, the trick is to use common sense when communicating over the Web and “speak” as you would to someone face to face—with self-control and politeness, exuberance and creativity, and simplicity—so that the message gets across!

As an assignment before the next class:

- ▶ *Email* at least one other student in the class.
- ▶ Participate in at least one *chat room*.
- ▶ Post at least one message on a *message* or *bulletin board*.

If you encounter difficulties in performing any of these activities, you can get help in the computer center at your college.

Describe your experiences and reactions to each of these experiences, and then engage in some critical thinking and write out your responses: how can these forms of electronic communication improve your academic performance? Enrich your social life? Save you time and money? Enhance your communication skills? Now think critically about some of the potential liabilities or risks involved with this type of communication. Do you see the possibility of your spending *too* much time online—a kind of “Net addiction”? How might email contribute to misunderstandings or cause you to express something that you might later regret? What precautions should you take before giving your real name, phone number, or address to someone you have met online? What are some of the dangers of meeting an online “friend” in person?

Becoming a Critical Thinker

In this chapter we have discovered that critical thinking is not just one way of thinking—it is a total approach to the way we make sense of the world, and it involves an integrated set of thinking abilities and attitudes that include the following:

- ▶ *Thinking actively* by using our intelligence, knowledge, and skills to question, explore, and deal effectively with ourselves, others, and life’s situations
- ▶ *Carefully exploring situations* by asking—and trying to answer—relevant questions
- ▶ *Thinking independently* by carefully examining various ideas and arriving at our own thoughtful conclusions
- ▶ *Viewing situations from different perspectives* to develop an in-depth, comprehensive understanding and *supporting viewpoints with reasons and evidence* to arrive at thoughtful, well-substantiated conclusions
- ▶ *Discussing ideas in an organized way* in order to exchange and explore ideas with others

These critical thinking qualities are a combination of cognitive abilities, basic attitudes, and thinking strategies that enable you to clarify and improve your

understanding of the world. By carefully examining the process and products of your thinking—and the thinking of others—you develop insight into the thinking process and learn to do it better. Becoming a critical thinker does not simply involve mastering certain thinking abilities, however; it affects the entire way that you view the world and live your life. For example, the process of striving to understand other points of view in a situation changes the way you think, feel, and behave. It catapults you out of your own limited way of viewing things, helps you understand others' viewpoints, and broadens your understanding. All of these factors contribute to your becoming a sophisticated thinker and mature human being.

Becoming a critical thinker is a lifelong process. Developing the thinking abilities needed to understand the complex world you live in and to make informed decisions requires ongoing analysis, reflection, and practice. The qualities of critical thinking that you have explored in this chapter represent signposts in your journey to become a critical thinker.

Critical thinkers are better equipped to deal with the difficult challenges that life poses: to solve problems, to establish and achieve goals, and to make sense of complex issues. The foundation of thinking abilities and critical attitudes introduced in these first two chapters will be reinforced and elaborated upon in the chapters ahead, helping to provide you with the resources to be successful at college, in your chosen career, and throughout the other areas of your life as well.

Creating a Thinking World

Becoming a critical thinker is not an isolated activity that is accomplished in a social vacuum. It's just the opposite! We are naturally social creatures, tied to one another in profound and complex ways. Fulfilling your potential as a critical thinker and living a meaningful life means developing productive relationships with others. As we have seen, critical thinkers are people who consistently make the effort to view situations from others' perspectives, to think—and feel—empathetically within their own point of view. This empathetic understanding is the basis for developing healthy relationships and an in-depth understanding of the world.

Unfortunately, many people are not striving to become critical thinkers, and as a result, a great amount of thoughtless, self-absorbed behavior is rampant in our society. In contrast, let's imagine a world in which *everyone* was committed to the critical thinking ideal of thoughtful reflection and empathetic understanding. What would such a world be like?

It would be a world in which people would not act rashly or speak foolishly without thinking. They would be reflective, carefully considering different points of view and thinking deeply about important issues. People would listen to what you had to say and would treat your views with respect, and if they disagreed with your point of view, they would explain *why* by providing intelligent reasons. At work, your boss would provide you with personal support and opportunities to take initiative, guiding you when you made mistakes, encouraging you to excel, and awarding you full credit for your accomplishments. Your relationships with family members would always be loving and honest as you worked together harmoniously for common purposes. Your relationship with your romantic partner would be intimate and supportive, expressing deep commitment and emotional honesty. Parents would nurture their children with unconditional love and raise them to respect the needs of others. People of all ages would display enlightened values, empathizing with the needs of others and trying to help those less fortunate. Lying, cheating, stealing, personal violence: none of these would exist; instead, they would be replaced by kindness, generosity, consideration, and goodwill. This would be a world filled with open-minded people who would welcome diverse ideas, customs, and personal differences. Racism, sexism, ageism, and all other forms of discrimination would be things of the past as all people would be treated with tolerance and consideration.

On a social level, all people would see themselves as members of the same community, with a responsibility for the well-being of all members, not just for themselves. Everyone would work together to create a better life for all. Wise and principled political leaders would be elected by a thoughtful citizenry, and they would govern with insight, honesty, and compassion. Children would be educated in a system that encouraged their individual talents and respected their unique value. Television shows would be designed to stimulate thinking and expand understanding as well as to entertain. People on talk shows would express thoughtful, articulate opinions, never stooping to superficial analyses or personal insults. On the road, people would drive with safety and consideration, never letting their anger or desire to move ahead more quickly take hold of them at the expense of others. When people did make mistakes, they would always accept responsibility, never trying to blame others for their own errors. Those who violated the law would be tried by juries who were astute thinkers, weighing the evidence judiciously and reaching fair-minded and well-supported verdicts.

On a personal level, you would be confident of your place in society and taken seriously by others who respected your special qualities. People would treat you with consideration, and you would reciprocate, with feelings of goodwill overwhelming any doubts or suspicions. You would think the best of people, and they would respond in kind. You would live your life under what philosophers used to call “the aspect of eternity,” reflecting on the purpose of your existence and your connections to humanity and the universe. When working with others, your productive discussions would always move toward the most logical and informed conclusions. You would be able to navigate intelligently through the daily avalanche of information, separating the useful from the irrelevant. You would have a deep understanding of complex social issues and would enjoy exploring their nuances through constructive conversations. You would live your life creatively, expressing yourself freely without fear of social condemnation. Your life would be vibrant, filled with satisfying relationships and accomplishments in which you would take great pride. You would enjoy the admiration of others as you steered a purposeful course which reflected your profound self-understanding. You would feel secure, strong, loved, happy, and fulfilled.

What would a world populated with critical thinkers be like? It would be a sublime world, the kind of world you would love to live in, the kind of world you would want for your children. It would be a world in which all people were able to achieve their personal potential, echoing the words of the writer Henry Miller:

We are all part of things,

We are all part of creation, all kings, all poets, all musicians,

We have only to open up, to discover what is already there.

Thinking Passages:

Assisted Suicide

One useful strategy for developing our critical thinking abilities is to contrast the views of people who discuss different sides of the same issue. The three articles that follow explore different perspectives on the issue of euthanasia (assisted suicide), focusing on the actions of Dr. Jack Kevorkian. Dr. Kevorkian—or “Dr. Death,” as he is commonly called—has long argued that assisted suicide should be a free and legal choice for patients. Having been acquitted of murder charges several times for providing patients with the means to kill themselves by using a “suicide machine” of

his own design, he recently took the dramatic step of having "60 Minutes" televise a tape of him giving a fatal injection to a man with Lou Gehrig's disease.

The controversy over assisted suicide has existed for several thousand years, but advances in modern medical technology are making these issues more acute today. The term *euthanasia*, first used by Aristotle in Ancient Greece to describe "the good death," exists in two distinct forms:

- ▶ *passive euthanasia*, in which life-sustaining measures are withdrawn, permitting people to die of their own medical problems
- ▶ *active euthanasia*, in which active measures are taken to end someone's life, such as administering a lethal injection

Apply the skills that we have been developing in this chapter by thinking critically about the ideas in the reading selections and then answering the questions that follow.

Prosecutor to Weigh Possibility of Charging Kevorkian

by Pam Belluck

A Michigan prosecutor said today that he would carefully review the videotapes of Dr. Jack Kevorkian injecting a terminally ill man with a lethal series of drugs, which [were] shown on television tonight, and other evidence before deciding whether to prosecute him.

Dr. Kevorkian said he had given CBS the videotapes, hoping that his actions in the death of the man, Thomas Youk, would lead to his arrest and become a dramatic test for euthanasia and assisted suicide.

"I want a showdown," Dr. Kevorkian told the *Oakland Press* of Michigan, in his only interview about the broadcast. "I want to be prosecuted for euthanasia. I am going to prove that this is not a crime ever, regardless of what words are written on paper."

During the CBS News program *60 Minutes*, Dr. Kevorkian is shown arranging the death of Mr. Youk, 52, of Waterford, Mich., said to be in the advanced stages of Lou Gehrig's disease. Dr. Kevorkian presents a consent form to Mr. Youk, who signed it. He asks Mr. Youk if he needs more time to think about his decision, saying, "Let's not hurry into this."

Then Dr. Kevorkian is shown, two nights later on Sept. 17, injecting Mr. Youk with drugs to make him sleep, then stop breathing, then to stop his heart from beating. When asked during the broadcast if he had killed Mr. Youk, Dr. Kevorkian said, "I did."

Dr. Kevorkian said this was not an assisted suicide, but euthanasia.

Today, the Oakland County prosecutor, David Gorcyca, suggested that the decision about whether to prosecute Dr. Kevorkian in the Youk case was not clear-cut. "We're going to have to review it from beginning to end," Mr. Gorcyca said.

Among the issues: whether Mr. Youk clearly consented to have Dr. Kevorkian help him die, Mr. Gorcyca said. He said his office was trying to obtain two unedited videotapes showing Dr. Kevorkian's conduct in Mr. Youk's death, and would try to get them with a search warrant or a subpoena if *60 Minutes* or Dr. Kevorkian did not surrender them voluntarily. Mr. Gorcyca said one tape showed "Kevorkian advising him how he's going to do it and then there's a tape of how he does it."

A Michigan law that took effect on Sept. 1 is the state's latest effort to outlaw assisted suicide. Between 1994 and 1996, Dr. Kevorkian, whose license to practice medicine has been revoked in Michigan and California, was tried and acquitted three times of charges related to the deaths of five people in Michigan. A fourth case ended in mistrial. He says he has helped more than 130 people kill themselves.

On *60 Minutes*, Dr. Kevorkian said that if he was convicted, he would starve himself to death in prison.

"I am tired of all the hypocrisy," he said to the newspaper, "and we're going to end this, one way or another."

Mr. Youk, who restored old Porsches and was an amateur race car driver, was so weak that the county medical examiner, Dr. Ljubisa Dragovich, said he would not have had the strength to inject himself. Today, the telephone number at the Youk home was out of order and there was no answer at the home of Mr. Youk's brother, Robert.

On the *60 Minutes* broadcast, Mr. Youk's wife, Melody, says that she was "so grateful to know that someone would relieve him of his suffering."

"I don't consider it murder," Ms. Youk said. "I consider it the way things should be done."

The consent form that Mr. Youk signed indicated that he consented to die by "direct injection" instead of using Dr. Kevorkian's "suicide machine," in which patients pull a string or trip a switch to administer the lethal dose themselves, according to the interview in the *Oakland Press*.

He told the newspaper, and *60 Minutes*, that he would prefer if all such patients opted for injections, because they were "faster, cleaner and easier" than the machine.

Dr. Kevorkian said he gave Mr. Youk the injection and videotaped the process, including his struggle to find a suitable vein in Mr. Youk's arm. He said it was the first time he had recorded the "actual event" of a death.

"See, look at the head," he said in the newspaper interview, as he pointed out details in the tape. "You can see he is dying. He is in such a deep sleep, there is no suffering."

When Dr. Kevorkian was asked in the *Oakland Press* interview if Mr. Youk had any last words, he laughed, possibly because Mr. Youk's words were barely intelligible.

"I don't know," he responded. "I never understood a thing he said."

Dr. Kevorkian's lawyer, David Gorosh, said he was not consulted about his client's plans to have the tape broadcast on national television. "I certainly didn't advise him to send the tape to *60 Minutes*," Mr. Gorosh said. "As a legal adviser, I certainly wouldn't advise him to do that."

Mr. Gorosh said he believed that "Dr. Kevorkian is simply indicating 'Either prosecute me and leave it there, or don't prosecute me and let's leave it once and for all.'"

Victor Skirmants, a close friend of Mr. Youk and a fellow auto racer said today that he did not know about Mr. Youk's desire to end his life. But he said he had seen his friend become increasingly incapacitated and suffer greatly in the last two years.

"It's a decision I myself would make," said Mr. Skirmants, 53. "I couldn't go beyond the point where I just couldn't function at all. I understand what he did."

Still, Mr. Skirmants said he did not want to watch the *60 Minutes* broadcast. He said he was tremendously relieved when Ms. Youk asked him and his wife not to watch.

"The fact that I don't have to see the video—I'm very thankful," Mr. Skirmants said. "I want to remember him the way I knew him."

***60 Minutes*, Kevorkian and a Death for the Cameras**

by Caryn James

It is not a gracefully composed camera shot: Dr. Jack Kevorkian blocks the camera's view as he injects his incurably ill patient, Thomas Youk, with lethal drugs. Sitting upright, wearing his glasses and a plaid shirt, Mr. Youk has been given a sedative and his head has lolled back out of camera range; perhaps because we cannot see his face, the off-camera voices commenting as they watch this videotape are more chilling than anything on screen.

"Is he dead now?" Mike Wallace asks.

"He's dying now," Dr. Kevorkian says.

The broadcast of Mr. Youk's death, shown last night on the CBS News Program *60 Minutes*, caused exactly the flurry of media attention Dr. Kevorkian and CBS were looking for. The report was denounced by everyone from George Will on the ABC News program *This Week* to John Cardinal O'Connor from the pulpit of St. Patrick's Cathedral, which simply made the critics part of the hype machine.

Mr. Youk, a 52-year-old man suffering the degeneration of Lou Gehrig's disease, asked Dr. Kevorkian to help him die. The doctor seized an opportunity to cross the legal line from assisted suicide, enabling patients to kill themselves, to euthanasia, actively administering a lethal injection.

But deeper boundaries were crossed as well. That this death was staged for the cameras is the most unsettling aspect of the story, a dark corollary to the growing assumption that the untelevised life is not worth living. Mr. Youk's untelevised death did not seem good enough for Dr. Kevorkian. The taping and its broadcast are, in the crudest terms, a stunt death.

The *60 Minutes* broadcast does not come in isolation, though. It is part of a climate in which many of life's most intimate areas are common grist for the media.

When President Clinton's illicit sex life made headlines, he responded in part by publicizing his meetings with spiritual advisers. If sex and religion have gone public, no wonder death has finally made an appearance on a Top 10 program, whose producers cannot be sorry this report appeared in the November sweeps period, when ratings turn into advertising dollars.

The fact that Dr. Kevorkian made the tape himself, and later brought it to *60 Minutes*, is beside the point. Dr. Kevorkian admits on the air that he wants the tape to lead to his arrest. By broadcasting it, CBS goes beyond reporting the news and becomes complicit, the carrier of a death played for the cameras.

It is that staged quality, evident in Mr. Youk's two taped encounters with Dr. Kevorkian, that is especially troubling. The *60 Minutes* report begins with Mr. Youk's first meeting with Dr. Kevorkian, which was videotaped. That tape turns out to be even more distressing than the moment of death. Mr. Youk is barely able to lift his hand, and is obviously struggling to speak and to breathe. He fears choking on his own saliva.

That tape, so painful to watch, makes it clear why Mr. Youk and his family turned to Dr. Kevorkian. Ironically, it makes the case for assisted suicide more powerfully than the death scene, which is so calm it seems anticlimactic as Dr. Kevorkian gives Mr. Youk three injections.

Watching the death adds nothing to the legitimate debate about euthanasia. Think about the equivalent: a news report about a grisly murder that goes on to show dismembered body parts. In televising this death, *60 Minutes* goes beyond reporting into lurid sensationalism. But without the death tape, no one would have noticed yet another feature on Dr. Kevorkian.

The *60 Minutes* report includes a brief attempt at balance. Dr. Mark Siegler, a medical ethicist at the University of Chicago, calls Dr. Kevorkian's action "a medicalized killing" and says it is "dangerous to patients and dangerous to society."

But the report races past its most profound and troubling issues, of free will and privacy. Dr. Kevorkian says that when he suggested euthanasia rather than assisted suicide to Mr. Youk, "I sensed a reluctance in him." Later we see Mr. Youk agreeing as Dr. Kevorkian reads aloud a statement for him to sign, stating there has been no duress, but we haven't a clue how that reluctance was overcome.

When Mr. Wallace interviews the Youk family after the death, Mr. Youk's wife says of his choice to die: "Tom's very private. And also he believes it's a private issue. You should be able to do what makes sense to you." She seems unaware of the irony that this private moment would be broadcast to the world.

The media landscape that fosters such a broadcast has changed radically in the past few years.

In 1994, the ABC News program *Prime Time Live* showed part of a Dutch documentary, *Death on Request*, in which a man with Lou Gehrig's disease died by his doctor's injection. Since then, the influence of the Internet has been pervasive.

As he was dying of cancer in 1996, Timothy Leary charted his last days on his Web site, where he planned to show his eventual suicide, though in the end he died off camera. This summer [1998] a baby's birth was shown on the Internet while it happened. And as the recent trajectory of political gossip has shown, a shaky bridge has been built from the Internet, with its editorial free-for-all, to the mainstream media. (Word of Representative Henry J. Hyde's decades-old adultery traveled in a flash from the on-line magazine Salon to newspapers and television.)

By showing Mr. Youk's death, *60 Minutes* creeps closer not only to the Internet but also to the lowest and literally cheapest form of television, reality programming. Whether it's *America's Funniest Home Videos* or *World's Wildest Police Videos*, reality programs foster the sense that real life is mere fodder for television; from there it is a small step to a life and now a death literally made for TV.

What is poignantly clear from the report is that Mr. Youk died without his family around him. They were sent away before Dr. Kevorkian began his injections, to avoid the chance they might be implicated in any crime. The television audience eventually watched, but we are not his family, a distinction *60 Minutes* blurred in its frightening conflation of public and private.

The shabby camera work at Mr. Youk's death spared us the worst horrors. The next televised death may be less amateurish and all the more disturbing as it looks straight into the eyes of a person who has agreed to die for the camera.

In No Hurry for Next Leg of the Journey

David Gonzalez

The waning afternoon sunlight slipped into the rooms of Calvary Hospital in the Bronx. Outside, the trees looked like propped-up sticks, gray, crooked and ready for winter. Inside, it was warm and quiet, in anticipation of a bigger chill. Michael Burke lay in his bed, the latest stop in a medical journey that started in September with treatment at another hospital for a cancer that spread from his colon to his lung and brain.

"The doctors think I'm terminal," he said. "I think I'm terminal."

Calvary Hospital bills itself as the country's only specialty hospital for adults in the final stages of advanced cancer. It is not a hospice, since its patients require constant medical attention to stabilize them and ease their pain. Doctors tend to nearly every aspect of a patient's physical and emotional comfort as well as helping families that are emotionally battered by the disease.

Doctors at Calvary, which started almost 100 years ago in a Greenwich Village house, see their work as a counterpoint to those who advocate "a definitive medical response" to terminal illness. In plain English, they offer the dying patient an alternative to assisted suicide. It's not a place that Dr. Jack Kevorkian, who was ordered this week to stand trial on murder charges for his role in a suicide shown on television, has ever visited.

Mr. Burke, 45, a mechanical contractor, understands how frustration and despair drive some people to suicide, even if they have received the best care. But he does not consider that an option, and he is alarmed by Dr. Kevorkian's increasingly brazen attempts to force the issue.

"He seems seriously aggressive about it," Mr. Burke said. "But what constitutes the envelope of what he considers candidates for euthanasia would become bigger and bigger. I think people need to make it difficult for guys like that."

Calvary operates under the auspices of the Roman Catholic Archdiocese of New York, so its opposition to suicide hews to church teaching. Its patients—200 on any given day—represent many faiths. In rare cases, critically ill patients arrive at the hospital asking for a quick end. More common are feelings of depression or emotional suffering, which, if not addressed by doctors, psychiatrists and social workers, could lead to desperate yearnings.

"Depression is more painful than physical pain," said Dr. Michael Brescia, the hospital's medical director. "Emotional suffering is the absence of love. This is a time when people have to say final farewells to their children. There are no more holidays. No future. You're not in this life, you're on the outside looking in. Everybody else has a life and you don't have one. Most people, if they ask for suicide, it's from the emotional aspects of this disease."

Those emotional hardships, doctors said, aren't made any easier by the difficulties patients have in persuading their health maintenance organizations to allow them to seek appropriate care in other hospitals, or at least let them check into Calvary when death is near. Dr. James Cimino, director of Calvary's palliative care institute, said the medical run-around has been exploited by proponents of assisted suicide, who present euthanasia as a dignified response to the indignities of the health care bureaucracy.

"Kevorkian forced us as a society to ask why people want to die prematurely," Dr. Cimino said. "But we should have confronted it before."

He knows that other doctors—good, well-meaning ones—also support euthanasia. But each day he sees patients who resist an early demise. "Maybe it's something about the nature of the person that they have this suffering, yet they don't request suicide," he said. "I don't want to get into the philosophy of that."

But Michael Burke does.

"Kevorkian is assuming there's nothing out there after this," he said. "I assume there is. I think that's where we part company."

He said that as long as he was comfortable—and he was—he had no problem. Suicide, he said, would be unfair to his wife and two children.

"I wouldn't want them to believe Daddy had the option of pushing this button and leaving," he said. "I'm not trying to squeeze every last moment. But if I can live for a week and see my son one more time, I would. As opposed to seeing Kevorkian this afternoon. Not that I think they would let him in the door here."

He gave a small smile and a thumbs-up sign. The gesture was his own definitive response.

Questions for Analysis

1. People who support euthanasia, in its active and/or passive forms, believe that the right to die is as integral a part of our human freedoms as the right to live. Based on your reading of the articles, cite reasons that support this way of thinking.
2. People opposed to euthanasia believe that we do not have the right to end a life prematurely, even when someone is in the last stages of a terminal disease or is being kept alive by life-sustaining equipment. Based on your reading of the articles, cite reasons that support this perspective.
3. The two terminally ill men described in these articles, Thomas Youk and Michael Burke, are in very similar medical situations, yet they come to very different conclusions about ending their own lives. Explain why you think that each man came to his particular conclusion.
4. Some people are concerned that legally permitting people to decide that their medical conditions are "hopeless" or "terminal" and that they are thus justified to end their lives establishes an elastic criterion that will inevitably lead to abuse and unnecessary deaths. Identify some of the potential abuses that might occur if society enacts laws legitimizing each of these different forms of euthanasia (as is already beginning to happen) and describe strategies that might be used to avoid these abuses.
5. The patient in the videotape (*Thinking Towards Decisions*) that accompanies this chapter is in a comatose state, being kept alive with a ventilator and feeding tube. Explain how people with differing views on euthanasia would analyze the family's situation and the choices they ought to make. Have you even been involved in a euthanasia situation with a family member or friend? Describe your experience.

John Chaffee

Thinking is the way you make sense of the world. By thinking in an active, purposeful, and organized way, you are able to solve problems, work toward your goals, analyze issues, and make decisions. Your experience of the world comes to you by means of your *senses*: sight, hearing, smell, touch, and taste. These senses are your bridges to the world, making you aware of what occurs outside you, and the process of becoming aware of your world through your senses is known as *perceiving*.

In this chapter you will explore the way your perceiving process operates and how it relates to your ability to think effectively. In particular, you will discover the way you shape your personal experience by actively selecting, organizing, and interpreting the sensations provided by the senses. In a way, each of us views the world through a pair of individual “eyeglasses” or “contact lenses” that reflect our past experiences and unique personalities. As a critical thinker, you want to become aware of the nature of your own “lenses” to help eliminate any bias or distortion they may be causing. You also want to become aware of the “lenses” of others so that you can better understand why they view things the way they do.

At almost every waking moment of your life, your senses are being bombarded by a tremendous number of stimuli: images to see, noises to hear, odors to smell, textures to feel, and flavors to taste. The experience of all these sensations happening at once creates what the nineteenth-century American philosopher William James called “a bloomin’ buzzin’ confusion.” Yet for us, the world usually seems much more orderly and understandable. Why is this so?

In the first place, your sense equipment can receive sensations only within certain limited ranges. For example, there are many sounds and smells that animals can detect but you cannot because their sense organs have broader ranges in these areas than yours do.

A second reason you can handle this sensory bombardment is that from the stimulation available, you *select* only a small amount on which to focus your attention. To demonstrate this, try the following exercise. Concentrate on what you can *see*, ignoring your other senses for the moment. Focus on sensations that you were not previously aware of and then answer the first question. Concentrate on each of your other senses in turn, following the same procedure.

1. What can you *see*? (For example, the shape of the letters on the page, the design of the clothing on your arm).
2. What can you *hear*? (For example, the hum of the air circulator, the rustling of a page).
3. What can you *feel*? (For example, the pressure of the clothes against your skin, the texture of the page on your fingers).
4. What can you *smell*? (For example, the perfume or cologne someone is wearing, the odor of stale cigarette smoke).
5. What can you *taste*? (For example, the aftereffects of your last meal).

PERCEIVING Actively selecting, organizing, and interpreting what is experienced by your senses.

Compare your responses with those of the other students in the class. Do your classmates perceive sensations that differ from the ones you perceived? If so, how do you explain these differences?

By practicing this simple exercise, it should be clear that for every sensation that you focus your attention on there are countless other sensations that you are simply ignoring. If you were aware of *everything* that is happening at every moment, you would be completely overwhelmed. By selecting certain sensations, you are able to make sense of your world in a relatively orderly way. The activity of using your senses to experience and make sense of your world is known as *perceiving*.

Actively Selecting, Organizing, and Interpreting Sensations

It is tempting to think that your senses simply record what is happening out in the world as if you were a human camera or tape recorder. You are not, however, a passive receiver of information, a “container” into which sense experience is poured. Instead, you are an *active participant* who is always trying to understand the sensations you are encountering. As you perceive your world, your experience is the result of combining the sensations you are having with the way you understand these sensations. For example, examine the following collection of markings. What do you see?



If all you see is a collection of black spots, try looking at the group sideways. After a while, you will probably perceive a familiar animal.

From this example you can see that when you perceive the world, you are doing more than simply recording what your senses experience. Besides experiencing sensations, you are also *actively making sense* of these sensations. That is why this collection of black spots suddenly became the figure of an animal—because you were able actively to organize these spots into a pattern you recognized. Or think about the times you were able to look up at the white, billowy clouds in the sky and see different figures and designs. The figures you were perceiving were not actually in the clouds but were the result of your giving a meaningful form to the shapes and colors you were experiencing.

The same is true for virtually everything you experience. Your perception of the world results from combining the information provided by your senses with the way you actively make sense of this information. And since making sense of information is what you are doing when you are thinking, you can see that perceiving your world involves using your mind in an active way. Of course, you are usually not aware that you are using your mind to interpret the sensations you are experiencing. You simply see the animal or the figures in the clouds as if they were really there.

When you actively perceive the sensations you are experiencing, you are usually engaged in three distinct activities:

1. *Selecting* certain sensations to pay attention to
2. *Organizing* these sensations into a design or pattern
3. *Interpreting* what this design or pattern means to you

In the case of the collection of markings, you were able to perceive an animal because you *selected* certain of the markings to concentrate on, *organized* these markings into a pattern, and *interpreted* this pattern as representing a familiar animal.

Of course, when you perceive, these three operations of selecting, organizing, and interpreting are usually performed quickly, automatically, and often simultaneously. Also, you are normally unaware that you are performing these operations because they are so rapid and automatic. This chapter is designed to help you slow down this normally automatic process of perceiving so that you can understand how the process works.

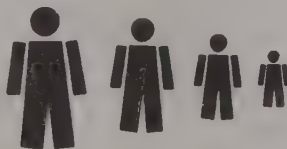
Let's explore more examples that illustrate how you actively select, organize, and interpret your perceptions of the world. Carefully examine the figure below.



Do you see both the young woman and the old woman? If you do, try switching back and forth between the two images. As you switch back and forth, notice how for each image you are:

- ▶ *Selecting* certain lines, shapes, and shadings on which to focus your attention
- ▶ *Organizing* these lines, shapes, and shadings into different patterns
- ▶ *Interpreting* these patterns as representing things that you are able to recognize—a hat, a nose, a chin

Another way for you to become aware of your active participation in perceiving your world is to consider how you see objects. Examine the illustration that follows:



Do you perceive different-sized people or the same-sized people at different distances?

When you see someone who is far away, you usually do not perceive a tiny person. Instead, you perceive a normal-sized person who is far away from you. Your experience in the world has enabled you to discover that the farther things are from you, the smaller they look. The moon in the night sky appears about the size of a

quarter, yet you perceive it as being considerably larger. As you look down a long stretch of railroad tracks or gaze up at a tall building, the boundary lines seem to come together. Even though these images are what your eyes “see,” however, you do not usually perceive the tracks meeting or the building coming to a point. Instead, your mind actively organizes and interprets a world composed of constant shapes and sizes, even though the images you actually see usually vary, depending on how far you are from them and the angle from which you are looking at them.

So far, we have been exploring how your mind actively participates in the way you perceive the world. By combining the sensations you are receiving with the way your mind selects, organizes, and interprets these sensations, you perceive a world of things that is stable and familiar, a world that usually makes sense to you.

The process of perceiving takes place at a variety of different levels. At the most basic level, the concept of “perceiving” refers to the selection, organization, and interpretation of sensations: for example, being able to perceive the various objects in your experience, like a basketball. However, you also perceive larger patterns of meaning at more complex levels, as in watching the action of a group of people engaged in a basketball game. Although these are very different contexts, both engage you in the process of actively selecting, organizing, and interpreting what is experienced by your senses—in other words, “perceiving.”

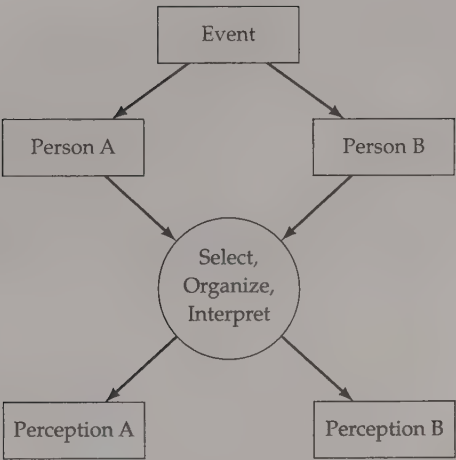
People's Perceptions Differ

Your *active* participation in perceiving your world is something you are not usually aware of. You normally assume that what you are perceiving is what is actually taking place. Only when you find that your perception of the same event differs from the perceptions of others are you forced to examine the manner in which you are selecting, organizing, and interpreting the events in your world.

Viewing the World Through “Lenses”

To understand how various people can be exposed to the same stimuli or events and yet have different perceptions, it helps to imagine that each of us views the world through our own pair of “contact lenses.” Of course, we are not usually aware of the lenses we are wearing. Instead our lenses act as *filters* that select and shape what we perceive without our realizing it.

This image of “lenses” helps explain why people can be exposed to the same stimuli or events and yet perceive different things. This happens because people are wearing *different lenses*, which influence what they are perceiving. For example, in “The Investigation,” each witness is giving what he or she (or it!) believes is an accurate description of the man in the center, unaware that their descriptions are being influenced by who they are and the way that they see things.



To understand the way people perceive the world, you have to understand their individual lenses, which influence how they actively select, organize, and interpret the events in their experience. A diagram of the process might look like this:

Consider the following pairs of statements. In each of these cases, both people are being exposed to the same basic *stimulus* or event, yet each has a totally different *perception* of the experience. Explain how you think the various perceptions might have developed.

- 1. a. That chili was much too spicy to eat.
Explanation:
- b. That chili needed more hot peppers and chili powder to spice it up a little.
Explanation:
- 2. a. People who wear lots of makeup and jewelry are very sophisticated.
Explanation:
- b. People who wear lots of makeup and jewelry are overdressed.
Explanation:
- 3. a. The music that young people enjoy listening to is a very creative cultural expression.
Explanation:
- b. The music that young people enjoy listening to is obnoxious noise.
Explanation:

To become an effective critical thinker, you have to become aware of the lenses that you—and others—are wearing. These lenses aid you in actively selecting, organizing, and interpreting the sensations in your experience. If you are unaware of the nature of your own lenses, you can often mistake your own perceptions for objective truth without bothering to examine either the facts or others' perceptions on a given issue.

Selecting Perceptions

We spend much of the time experiencing the world in a very general way, unaware of many of the details of the events that are taking place. For example, try to draw a picture of the face of a push-button phone, complete with numbers and letters. Then compare your drawing with an actual phone. Did you have any difficulty? Why? We also tend to select perceptions about subjects that have been called to our

attention for some reason. For instance, at the age of three, my daughter suddenly became aware of beards. Upon entering a subway car, she would ask in a penetrating voice, "Any beards here?" and then would proceed to count them out loud. In doing this, she naturally focused my attention—as well as the attention of many of the other passengers—on beards.

As another aspect of our "perceiving" lenses, we tend to notice what we need, desire, or find of interest. When we go shopping, we focus on the items we are looking for. Walking down the street, we tend to notice certain kinds of people or events while completely ignoring others. Even while watching a movie or reading a book, we tend to concentrate on and remember the elements we find of interest. Another person can perform *exactly* the same actions—shop at the same store, walk down the same street with you, read the same book, or go to the same movie—and yet see and remember entirely different things. In other words, what you see and do not see depends largely on your interests, needs, and desires.

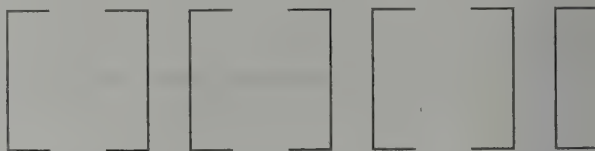
The way you are feeling—your mood or emotional state—can also affect the perceptions you select. For example, think back on the times when you have felt cranky, perhaps because you did not get enough sleep or were under pressure, and recall how you behaved. When we are in bad moods, we often seem ready to focus our attention on every potential insult or criticism made by others—and are ready to respond the same way.

Although we tend to focus on what is familiar to us, we are normally not aware that we are doing so. In fact, we often take for granted what is familiar to us—the taste of chili or eggs, the street that we live on, our family or friends—and normally do not think about our perception of it. But when something happens that makes the familiar seem strange and unfamiliar, we become aware of our perceptions and start to evaluate them.

To sum up, you actively select your perceptions based on what has been called to your attention, your needs or interests, your mood or feelings, and what seems familiar or unfamiliar. The way you select your perceptions is an important factor in shaping the lenses through which you view the world.

Organizing Perceptions

Not only do you actively *select* certain perceptions, you also actively *organize* these perceptions into meaningful relationships and patterns. Consider the following series of lines:



Did you perceive them as individual lines or did you group them into pairs? We seem naturally to try to organize our perceptions to create order and meaning. Consider the items pictured next and try to organize them into a pattern that is familiar to you:



As you perceive the world, you naturally try to order and organize what you are experiencing into patterns and relationships that make sense to you. And when you are able to do so, the completed whole means more to you than the sum of the individual parts. You are continually organizing your world in this way at virtually every waking moment.

We do not live in a world of isolated sounds, patches of color, random odors, and individual textures. Instead, we live in a world of objects and people, language and music—a world in which all these individual stimuli are woven together. We are able to perceive this world of complex experiences because we are able to organize the individual stimuli we are receiving into relationships that have meaning for us.

The way you organize your experience is an important part of the lenses through which you perceive the world. You are able to perceive objects, human expressions, and potential human action because of your ability to organize the lines, shapes, and shadings into meaningful patterns and complex relationships.

Interpreting Perceptions

Besides selecting and organizing your perceptions, you also actively *interpret* what you perceive. When you interpret, you are figuring out what something means. One of the elements that influences your interpretations of what you are perceiving is the *context*, or overall situation, within which the perception is occurring. For example, imagine that you see a man running down the street. Your interpretation of his action will depend on the specific context. For example, is there a bus waiting at the corner? Is a police officer running behind him? Is he wearing a jogging suit?

You are continually trying to interpret what you perceive, whether it is a design, someone's behavior, or a social situation. Like the example of someone running down the street, many of the perceptions you experience can be interpreted in more than one way. When a situation has more than one possible interpretation, you say that it is *ambiguous*. The more ambiguous a situation is, the greater the number of possible meanings or interpretations it has.

In “The Investigation,” each person's description of what was happening—and what was about to happen—was based on his or her interpretation of the situation. Each interpretation simply reveals the lenses through which this person views the world. Of course, you may feel that some interpretations make more sense than others, based on the details and the relationships that you perceive in the situation.

Your perceptions reveal the lenses through which you are viewing the event. Watching your team play baseball, for example, you may really believe that the opposing runner was “out by a mile”—even though the replay may show otherwise. Or imagine that you are giving a speech to the class and that you are being evaluated by two people—someone who likes you and someone who does not. Do you believe that different perceptions of your performance may result?

Similarly, the way you are feeling can influence your interpretations of what you are experiencing. When you feel happy and optimistic, the world often seems friendly and the future full of possibilities, and you interpret the problems you encounter as challenges to be overcome. On the other hand, when you are depressed or unhappy, you may perceive your world entirely differently. The future can appear full of problems that are trying to overwhelm you. In both cases the outer circumstances may be very similar; it is your own interpretation of the world through your lenses that varies so completely.

Your perceptions of the world are dramatically influenced by your past experiences: the way you were brought up, the relationships you have had, and the training and education you have undergone. Take the case of two people who are watching a football game. One person, who has very little understanding of football, sees merely a bunch of grown men hitting each other for no apparent reason. The other person, who loves football, sees complex play patterns, daring coaching strategies, effective blocking and tackling techniques, and zone defenses with “seams” that the receivers are trying to “split.” Both have their eyes focused on the same event, but they are perceiving two entirely different situations. Their perceptions differ because each person is actively selecting, organizing, and interpreting the available stimuli in different ways. The same is true of any situation in which

you are perceiving something about which you have special knowledge or expertise. The following are examples:

- ▶ A builder examining the construction of a new house
- ▶ A music lover attending a concert
- ▶ A naturalist experiencing the outdoors
- ▶ A cook tasting a dish just prepared
- ▶ A lawyer examining a contract
- ▶ An art lover visiting a museum

Think about a special area of interest or expertise that you have and how your perceptions of that area differ from those who don't share your knowledge. Ask other class members about their areas of expertise. Notice how their perceptions of that area differ from your own because of their greater knowledge and experience.

In all these cases, the perceptions of the knowledgeable person differ substantially from the perceptions of a person who lacks knowledge of that area. Of course, you do not have to be an expert to have more fully developed perceptions. It is a matter of degree. In general, the more understanding you have of a particular area, the more detailed and complete your perceptions can be of all matters related to it.

Thinking Activity 6.1

Analyzing Different Accounts of the Assassination of Malcolm X

Let's examine a situation in which a number of different people had somewhat different perceptions about an event they were describing. The work of Malcolm X came to a tragic end in February 1965 with his assassination at a meeting in Harlem. The following are five different accounts of what took place on that day. As you read through the various accounts, pay particular attention to the different perceptions each one presents of this event. After you have finished reading the accounts, analyze some of the differences in these perceptions by answering the questions that follow.

Five Accounts of the Assassination of Malcolm X

The New York Times (February 22, 1965)

Malcolm X, the 39-year-old leader of a militant Black Nationalist movement, was shot to death yesterday afternoon at a rally of his followers in a ballroom in Washington Heights. The bearded Negro extremist had said only a few words of greeting when a fusillade rang out. The bullets knocked him over backwards.

A 22-year-old Negro, Thomas Hagan, was charged with the killing. The police rescued him from the ballroom crowd after he had been shot and beaten.

Pandemonium broke out among the 400 Negroes in the Audubon Ballroom at 160th Street and Broadway. As men, women and children ducked under tables and flattened themselves on the floor, more shots were fired. The police said seven bullets struck Malcolm. Three other Negroes were shot. Witnesses reported that as many as 30 shots had been fired. About two hours later the police said the shooting had apparently been a result of a feud between followers of Malcolm and members of the extremist group he broke with last year, the Black Muslims. . . .

Life (March 5, 1965)

His life oozing out through a half dozen or more gunshot wounds in his chest, Malcolm X, once the shrillest voice of black supremacy, lay dying on the stage of a Manhattan auditorium. Moments before, he had stepped up to the lectern and 400 of the faithful had settled down expectantly to hear the sort of speech for which he was famous—flaying the hated white man. Then a scuffle broke out in the hall and Malcolm's bodyguards bolted from his side to break it up—only to discover that they had been faked out. At least two men with pistols rose from the audience and pumped bullets into the speaker, while a third cut loose at close range with both barrels of a sawed-off shotgun. In the confusion the pistol man got away. The shotgunner lunged through the crowd and out the door, but not before the guards came to their wits and shot him in the leg. Outside he was swiftly overtaken by other supporters of Malcolm and very likely would have been stomped to death if the police hadn't saved him. Most shocking of all to the residents of Harlem was the fact that Malcolm had been killed not by "whitey" but by members of his own race.

The New York Post (February 22, 1965)

They came early to the Audubon Ballroom, perhaps drawn by the expectation that Malcolm X would name the men who firebombed his home last Sunday. . . . I sat at the left in the 12th row and, as we waited, the man next to me spoke of Malcolm and his followers: "Malcolm is our only hope. You can depend on him to tell it like it is and to give Whitey hell." . . .

There was a prolonged ovation as Malcolm walked to the rostrum. Malcolm looked up and said, "A salaam aleikum (Peace be unto you)," and the audience replied, "We aleikum salaam (And unto you, peace)."

Besppectacled and dapper in a dark suit, sandy hair glinting in the light, Malcolm said: "Brothers and sisters . . ." He was interrupted by two men in the center of the ballroom, who rose and, arguing with each other, moved forward. Then there was a scuffle at the back of the room. I heard Malcolm X say his last words: "Now, brothers, break it up," he said softly. "Be cool, be calm."

Then all hell broke loose. There was a muffled sound of shots and Malcolm, blood on his face and chest, fell limply back over the chairs behind him. The two men who had approached him ran to the exit on my side of the room, shooting wildly behind them as they ran. I heard people screaming, "Don't let them kill him." "Kill those bastards." At an exit I saw some of Malcolm's men beating with all their strength on two men. I saw a half dozen of Malcolm's followers bending over his inert body on the stage. Their clothes were stained with their leader's blood.

Four policemen took the stretcher and carried Malcolm through the crowd and some of the women came out of their shock and one said: "I hope he doesn't die, but I don't think he's going to make it."

Associated Press (February 22, 1965)

A week after being bombed out of his Queens home, Black Nationalist leader Malcolm X was shot to death shortly after 3 (P.M.) yesterday at a Washington Heights rally of 400 of his devoted followers. Early today, police brass ordered a homicide charge placed against a 22-year-old man they rescued from a savage beating by Malcolm X supporters after the shooting. The suspect, Thomas Hagan, had been shot in the left leg by one of Malcolm's bodyguards as, police said, Hagan and another assassin fled when pandemonium erupted. Two other men were wounded in the wild burst of firing from at least three weapons. The firearms were a .38, a .45 automatic and a sawed-off shotgun. Hagan allegedly shot Malcolm X with the shotgun, a double-barreled sawed-off weapon on which the stock also had been shortened, possibly to facilitate concealment. Cops charged Reuben Frances, of 871 E. 179th St., Bronx, with felonious assault in the

shooting of Hagan, and with Sullivan Law violation—possession of the .45. Police recovered the shotgun and the .45.

The *Amsterdam News* (February 27, 1965)

"We interrupt this program to bring you a special newscast. . .," the announcer said as the Sunday afternoon movie on the TV set was halted temporarily. "Malcolm X was shot four times while addressing a crowd at the Audubon Ballroom on 166th street." "Oh no!" That was my first reaction to the shocking event that followed one week after the slender, articulate leader of the Afro-American Unity was routed from his East Elmhurst home by a bomb explosion. Minutes later we alighted from a cab at the corner of Broadway and 166th St. just a short 15 blocks from where I live on Broadway. About 200 men and women, neatly dressed, were milling around, some with expressions of awe and disbelief. Others were in small clusters talking loudly and with deep emotion in their voices. Mostly they were screaming for vengeance. One woman, small, dressed in a light gray coat and her eyes flaming with indignation, argued with a cop at the St. Nicholas corner of the block. "This is not the end of it. What they were going to do to the statue of Liberty will be small in comparison. We black people are tired of being shoved around." Standing across the street near the memorial park one of Malcolm's close associates commented: "It's a shame." Later he added that "if it's war they want, they'll get it." He would not say whether Elijah Muhammed's followers had anything to do with the assassination. About 3:30 p.m. Malcolm X's wife, Betty, was escorted by three men and a woman from the Columbia Presbyterian Hospital. Tears streamed down her face. She was screaming, "They killed him!" Malcolm X had no last words. . . . The bombing and burning of the No. 7 Mosque early Tuesday morning was the first blow by those who are seeking revenge for the cold-blooded murder of a man who at 39 might have grown to the stature of respectable leadership.

Questions for Analysis

1. What details of the events has each writer *selected* to focus on?
2. How has each writer *organized* the details that have been selected? Remember that most news organizations present what they consider the most important information first and the least important information last.
3. How does each writer *interpret* Malcolm X, his followers, the gunmen, and the significance of the assassination?
4. How has each author used *language* to express his/her perspective and to influence the thinking of the reader?

Thinking Activity 6.2

Analyzing Multiple Perspectives

Locate three different newspaper or magazine accounts of an important event—a court decision, a crime, and a political demonstration are possible topics. Analyze the perceptual "lenses" of each of the writers by answering the questions in Thinking Activity 6.1.

Experiences Shape Your Perceptions

Your ways of viewing the world are developed over a long period of time through the experiences you have and your thinking about these experiences. As you think critically about your perceptions, you learn more from your experiences and about how you make sense of the world. Your perceptions may be strengthened by this understanding, or they may be changed by this understanding. For example, read the following student passage and consider the way her experiences—and her reflection on these experiences—contributed to shaping her perspective on the world.

Acquired Knowledge

When news of the Acquired Immune Deficiency Syndrome first began to spread, it was just another one of those issues on the news that I felt did not really concern me. Along with cancer, leukemia, and kidney failure, I knew these diseases ran rampant across the country, but they didn't affect me.

Once the AIDS crisis became a prevalent problem in society, I began to take a little notice of it, but my interest only extended as far as taking precautions to insure that I would not contract the disease. Sure, I felt sorry for all the people who were dying from it, but again, it was not my problem.

My father was an intravenous drug user for as long as I can remember. This was a fact of life when I was growing up. I knew that what he was doing was wrong, and that eventually he would die from it, but I also knew that he would never change.

On July 27th, my father died. An autopsy showed his cause of death as pneumonia and tuberculosis, seemingly natural causes. However, I was later informed that these were two very common symptoms related to carriers of the HIV virus. My father's years of drug abuse had finally caught up with him. He had died from AIDS.

My father's death changed my life. Prior to that, I had always felt that as long as a situation did not directly affect me, it was really no concern of mine. I felt that somewhere, someone would take care of it. Having a crisis strike so close to me made me wake up to reality. Suddenly I became acutely aware of all the things that are wrong in the world. I began to see the problems of AIDS, famine, homelessness, unemployment, and others from a personal point of view, and I began to feel that I had an obligation to join the crusade to do something about these problems.

I organized a youth coalition called UPLIFT INC. In this group, we meet and talk about the problems in society, as well as the everyday problems that any of our members may have in their lives. We organize shows (talent shows, fashion shows) and give a large portion of our proceeds to the American Foundation for AIDS Research, the Coalition for the Homeless, and many other worthy organizations.

Now I feel that I am doing my duty as a human being by trying to help those who are less fortunate than myself. My father's death gave me insight into my own mortality. Now I know that life is too short not to only try to enjoy it, but to really achieve something worthwhile out of it. Material gains matter only if you are willing to take your good fortune and spread it around to those who could use it.

In the reading selection located on page 000, a former migrant worker and current union organizer named Roberto Acuna describes changes in his perceptions of his world. Acuna's story illustrates the main purpose of our ongoing attempts to think critically about the way our experiences shape our perceptions. By engaging in this process, we are continually trying to develop a clearer and more complete understanding of what is taking place so that we can make the most effective decisions in our lives. Because our perceptions are based on our experiences, they often change and evolve based on new experiences. Analyzing Roberto Acuna's personal odyssey will illustrate how experiences can shape and reshape our perceptions.

Thinking Activity 6.3

Describing a Shaping Experience

Think of an experience that has shaped your life. Write an essay describing the experience and the ways it changed your life and how you perceive the world. After writing, analyze your experience by answering the following questions.

1. What were your *initial* perceptions of the situation? As you began the experience, you brought into the situation certain perceptions about the experience and the people involved.
2. What previous experiences had you undergone? Identify some of the influences that helped to shape these perceptions. Describe the actions that you either took or thought about taking.
3. As you became involved in the situation, what experiences in the situation influenced you to question or doubt your initial perceptions?
4. In what new ways did you view the situation that would better explain what was taking place? Identify the revised perceptions that you began to form about the experience.

Thinking Critically About Perceptions

So far, we have emphasized the great extent to which you actively participate in what you perceive by selecting, organizing, and interpreting. We have suggested that each of us views the world through our own unique lenses. This means that no two of us perceive the world in exactly the same way.

Because we actively participate in selecting, organizing, and interpreting the sensations we experience, however, our perceptions are often incomplete, inaccurate, or subjective. To complicate the situation even more, our own limitations in perceiving are not the only ones that can cause us problems. Other people often purposefully create perceptions and misperceptions. An advertiser who wants to sell a product may try to create the impression that your life will be changed if you use this product. Or a person who wants to discredit someone else may spread untrue rumors about her in order to influence others' perceptions of her.

The only way you can correct the mistakes, distortions, and incompleteness of your perceptions is to *become aware* of this normally unconscious process by which you perceive and make sense of your world. By becoming aware of this process, you can think critically about what is going on and then correct your mistakes and distortions. In other words, you can use your critical thinking abilities to create a clearer and more informed idea of what is taking place. Perception alone cannot be totally relied on, and if you remain unaware of how it operates and of your active role, then you will be unable to exert any control over it. And in that case, you will be convinced that the way *you see* the world is the way the world *is*, even when your perceptions are mistaken, distorted, or incomplete.

The first step in critically examining your perceptions is to be willing to *ask questions* about what you are perceiving. As long as you believe that the way you see things is the only way to see them, you will be unable to recognize when your perceptions are distorted or inaccurate. For instance, if you are certain that your interpretation of the boy at the computer in Thinking Activity 4.1 or the photograph in Thinking Activity 4.2 is the only correct one, then you will not be likely to try and

see other possible interpretations. But if you are willing to question your perception (“What are some other possible interpretations?”), then you will open the way to more fully developing your perception of what is taking place.

Besides asking questions, you have to try to become aware of the personal factors your lenses bring to your perceptions. As you have seen, each of us brings to every situation a whole collection of expectations, interests, fears, and hopes that can influence what we are perceiving. Consider the following situations:

You’ve been fishing all day without a nibble. Suddenly you get a strike! You reel it in, but just as you’re about to pull the fish into the boat, it frees itself from the hook and swims away. When you get back home later that night, your friends ask you: “How large was the fish that got away?”

The teacher asks you to evaluate the performance of a classmate who is giving a report to the class. You don’t like this other student because he acts as if he’s superior to the rest of the students in the class. How do you evaluate his report?

You are asked to estimate the size of an audience attending an event that your organization has sponsored. How many people are there?

In each of these cases, you can imagine that your perceptions might be influenced by certain hopes, fears, or prejudices that you brought to the situation, causing your observations to become distorted or inaccurate. Although you usually cannot eliminate the personal feelings that are influencing your perceptions, you can become aware of them and try to control them. For instance, if you are asked to evaluate a group of people, one of whom is a good friend, you should try to keep these personal feelings in mind when making your judgment in order to make your perceptions as accurate as possible.

Critical thinkers strive to see things from different perspectives. One of the best ways to do so is by communicating with others and engaging in *dialogue* with them. This means exchanging and critically examining ideas in an open and organized way. Similarly, dialogue is one of the main ways that you check your perceptions—by asking others what their perceptions are and then comparing and contrasting these with your own. This is exactly what you did when you discussed the different possible interpretations of the boy at the computer and the ambiguous photograph. By exchanging your perceptions with the perceptions of other class members, you developed a more complete sense of how these different events could be viewed, as well as the reasons that support these different perspectives.

Looking for reasons that support various perceptions also involves trying to discover any independent proof or evidence regarding the perception. When evidence is available in the form of records, photographs, videotapes, or experimental results, this information will certainly help you evaluate the accuracy of your perceptions. For example, consider the situations just described. What are some of the independent forms of evidence you could look for in trying to verify your perceptions?

Thinking critically about your perceptions means trying to avoid developing impulsive or superficial perceptions that you are unwilling to change. Critical thinkers are *thoughtful* in approaching the world and *open* to modifying their views in the light of new information or better insight. Consider the following perceptions:

- ▶ Women are very emotional.
- ▶ Politicians are corrupt.
- ▶ Teenagers are wild and irresponsible.
- ▶ People who are good athletes are usually poor students.
- ▶ Men are thoughtless and insensitive.

These types of general perceptions are known as *stereotypes* because they express a belief about an entire group of people without recognizing the individual differences among members of the group. For instance, it is probably accurate to say that there are *some* politicians who are corrupt, but this is not the same thing as saying that all, or even most, politicians are corrupt. Stereotypes affect your perception of the world because they encourage you to form an inaccurate and superficial idea of a whole group of people (“All teenagers are reckless drivers”). When you meet someone who falls into this group, you automatically perceive that person as having these stereotyped qualities (“This person is a teenager, so he is a reckless driver”). Even if you find that this person does not fit your stereotyped perception (“This teenager is not a reckless driver”), this sort of superficial and unthoughtful labeling does not encourage you to change your perception of the group as a whole. Instead, it encourages you to overlook the conflicting information in favor of your stereotyped perception (“All teenagers are reckless drivers—except for this one”). On the other hand, when you are perceiving in a thoughtful fashion, you try to see what a person is like as an individual, instead of trying to fit him or her into a preexisting category.

Thinking Activity 6.4

Analyzing Stereotypes

1. Describe an incident in which you were perceived as a stereotype because of your age, ethnic or religious background, employment, accent, or place of residence.
 2. Describe how it felt to be stereotyped in this way.
 3. Explain what you think are the best ways to overcome stereotypes such as these.
-

Summary

As your mind develops through the experiences you have and your reflection on these experiences, your perceptions of the world should continue to develop as well. By thinking critically about your perceptions, by seeking to view your world from perspectives other than your own and to understand the reasons that support these perspectives, your understanding of the world should become increasingly accurate and complete. You can view your efforts to think critically about what you are perceiving as a problem-solving process, as you continually attempt to interpret your experiences.

As you have seen in this chapter, much of your knowledge of the world begins with perceiving. But to develop knowledge and understanding, you must make use of your thinking abilities in order to examine this experience critically. Increased understanding of the way the world operates thus increases the accuracy and completeness of your perceptions and leads you to informed beliefs about what is happening. In the next chapter we will be exploring further how to develop informed beliefs and knowledge of the world by combining perceptions with critical thinking.

Thinking Passage

Migrant Worker

This section is taken from the book *Working: People Talk About What They Do All Day and How They Feel About What They Do* by Studs Terkel. Terkel traveled throughout the United States interviewing people from a wide range of occupations, including farmers, steelworkers, corporate executives, and prostitutes. In his narrative, Roberto Acuna describes how he became an organizer for the United Farm Workers of America. At the beginning of his narrative, Acuna says, "The things I saw shaped my life." After reading his story, ask yourself, "Did 'things' shape Acuna's life? Or did Acuna shape and reshape the things he saw into his life?"

Migrant Worker

by Roberto Acuna

I walked out of the fields two years ago. I saw the need to change the California feudal system, to change the lives of farm workers, to make these huge corporations feel they're not above anybody. I am thirty-four years old and I try to organize for the United Farm Workers of America.

His hands are calloused and each of his thumbnails is singularly cut. If you're picking lettuce, the thumbnails fall off 'cause they're banged on the box. Your hands get swollen. You can't slow down because the foreman sees you're so many boxes behind and you'd better get on. But people would help each other. If you're feeling bad that day, somebody who's feeling pretty good would help. Any people that are suffering have to stick together, whether they like it or not, whether they be black, brown, or pink.

According to Mom, I was born on a cotton sack out in the fields, 'cause she had no money to go to the hospital. When I was a child, we used to migrate from California to Arizona and back and forth. The things I saw shaped my life. I remember when we used to go out and pick carrots and onions, the whole family. We tried to scratch a livin' out of the ground. I saw my parents cry out in despair, even though we had the whole family working. At the time, they were paying sixty-two and a half cents an hour. The average income must have been fifteen hundred dollars, maybe two thousand.*

This was supplemented by child labor. During those years, the growers used to have a Pick-Your-Harvest Week. They would get all the migrant kids out of school and have 'em out there pickin' the crops at peak harvest time. A child was off that week and when he went back to school, he got a little gold star. They would make it seem like something civic to do.

We'd pick everything: lettuce, carrots, onions, cucumbers, cauliflower, broccoli, tomatoes—all the salads you could make out of vegetables, we picked 'em. Citrus fruits, watermelons—you name it. We'd be in Salinas about four months. From there we'd go down into the Imperial Valley. From there we'd go to picking citrus. It was like a cycle. We'd follow the seasons.

After my dad died, my mom would come home and she'd go into her tent and I would go into ours. We'd roughhouse and everything and then we'd go into the tent where Mom was sleeping and I'd see her crying. When I asked her why she was crying she never gave me an answer. All she said was things would get better. She retired a beaten old lady with a lot of dignity. That day she thought would be better never came for her.

One time, my mom was in bad need of money, so she got a part-time evening job in a restaurant. I'd be helping her. All the growers would come in and they'd be laughing,

*"Today, because of our struggles, the pay is up to two dollars an hour. Yet we know that is not enough."

making nasty remarks, and make passes at her. I used to go out there and kick 'em and my mom told me to leave 'em alone, she could handle 'em. But they would embarrass her and she would cry.

My mom was a very proud woman. She brought us up without any help from nobody. She kept the family strong. They say that a family that prays together stays together. I say that a family that works together stays together—because of the suffering. . . .

I'd go barefoot to school. The bad thing was they used to laugh at us, the Anglo kids. They would laugh because we'd bring tortillas and frijoles to lunch. They would have their nice little compact lunch boxes with cold milk in their thermos and they'd laugh at us because all we had was dried tortillas. Not only would they laugh at us, but the kids would pick fights. My older brother used to do most of the fighting for me and he'd come home with black eyes all the time.

I wanted to be accepted. It must have been in sixth grade. It was just before the Fourth of July. They were trying out students for this patriotic play. I wanted to do Abe Lincoln, so I learned the Gettysburg Address inside and out. I'd be out in the fields pickin' the crops and I'd be memorizin'. I was the only one who didn't have to read the part, 'cause I learned it. The part was given to a girl who was a grower's daughter. She had to read it out of a book, but they said she had better diction. I was very disappointed. I quit about eighth grade.

Any time anybody'd talk to me about politics, about civil rights, I would ignore it. It's a very degrading thing because you can't express yourself. They wanted us to speak English in the school classes. We'd put out a real effort. I would get into a lot of fights because I spoke Spanish and they couldn't understand it. I was punished. I was kept after school for not speaking English.

We used to have our own tents on the truck. Most migrants would live in the tents that were already there in the fields, put up by the company. We got one for ourselves, secondhand, but it was ours. Anglos used to laugh at us. "Here comes the carnival," they'd say. We couldn't keep our clothes clean, we couldn't keep nothing clean, because we'd go by the dirt roads and the dust. We'd stay outside the town.

I never did want to go to town because it was a very bad thing for me. We used to go to the small stores, even though we got clipped more. If we went to the other stores, they would laugh at us. They would always point at us with a finger. We'd go to town maybe every two weeks to get what we needed. Everybody would walk in a bunch. We were afraid. (Laughs.) We sang to keep our spirits up. We joked about our poverty. This one guy would say, "When I get to be rich, I'm gonna marry an Anglo woman, so I can be accepted into society." The other guy would say, "When I get rich I'm gonna marry a Mexican woman, so I can go to that Anglo society of yours and see them hang you for marrying an Anglo." Our world was around the fields.

I started picking crops when I was eight. I couldn't do much, but every little bit counts. Every time I would get behind on my chores, I would get a carrot thrown at me by my parents. I would daydream: If I were a millionaire, I would buy all these ranches and give them back to the people. I would picture my mom living in one area all the time and being admired by all the people in the community. All of a sudden I'd be rudely awakened by a broken carrot in my back. That would bust your whole dream apart and you'd work for a while and come back to daydreaming.

We used to work early, about four o'clock in the morning. We'd pick the harvest until about six. Then we'd run home and get into our supposedly clean clothes and run all the way to school because we'd be late. By the time we got to school, we'd be all tucked out. Around maybe eleven o'clock, we'd be dozing off. Our teachers would send notes to the house telling Mom that we were inattentive. The only thing I'd make fairly good grades on was spelling. I couldn't do anything else. Many times we never did our homework, because we were out in the fields. The teachers couldn't understand that. I would get whacked there also.

School would end maybe four o'clock. We'd rush home again, change clothes, go back to work until seven, seven-thirty at night. That's not counting the weekends. On

Saturday and Sunday, we'd be there from four-thirty in the morning until about seven-thirty in the evening. This is where we made the money, those two days. We all worked.

I would carry boxes for my mom to pack the carrots in. I would pull the carrots out and she would sort them into different sizes. I would get water for her to drink. When you're picking tomatoes, the boxes are heavy. They weigh about thirty pounds. They're dropped very hard on the trucks so they have to be sturdy.

The hardest work would be thinning and hoeing with a short-handled hoe. The fields would be about a half mile long. We would be bending and stooping all day. Sometimes you would have hard ground and by the time you got home, your hands would be full of calluses. And you'd have a backache. Sometimes I wouldn't have dinner or anything. I'd just go home and fall asleep and wake up just in time to go out to the fields again.

The grower would keep the families apart, hoping they'd fight against each other. He'd have three or four camps and he'd have the people over here pitted against the people over there. For jobs. He'd give the best crops to the people he thought were the fastest workers. This way he kept you going harder and harder, competing.

When I was sixteen, I had my first taste as a foreman. Handling braceros, aliens, that came from Mexico to work. They'd bring these people to work over here and then send them back to Mexico after the season was over. My job was to make sure they did a good job and pushin' 'em even harder. I was a company man, yes. My parents needed money and I wanted to make sure they were proud of me. A foreman is recognized. I was very naive. Even though I was pushing the workers, I knew their problems. They didn't know how to write, so I would write letters home for them. I would take them to town, buy their clothes, outside of the company stores. They paid me \$1.10 an hour. The farm workers' wage was raised to eighty-two and a half cents. But even the braceros were making more money than me, because they were working piecework. I asked for more money. The manager said, "If you don't like it you can quit." I quit and joined the Marine Corps.

I joined the Marine Corps at seventeen. I was very mixed up. I wanted to become a first-class citizen. I wanted to be accepted and I was very proud of my uniform. My mom didn't want to sign the papers, but she knew I had to better myself and maybe I'd get an education in the services.

I did many jobs. I took a civil service exam and was very proud when I passed. Most of the others were college kids. There were only three Chicanos in the group of sixty. I got a job as a correctional officer in a state prison. I quit after eight months because I couldn't take the misery I saw. They wanted me to use a rubber hose on some of the prisoners—mostly Chicanos and blacks. I couldn't do it. They called me chicken-livered because I didn't want to hit nobody. They constantly harassed me after that. I didn't quit because I was afraid of them but because they were trying to make me into a mean man. I couldn't see it. This was Soledad State Prison.

I began to see how everything was so wrong. When growers can have an intricate watering system to irrigate their crops but they can't have running water inside the houses of workers. Veterinarians tend to the needs of domestic animals but they can't have medical care for the workers. They can have land subsidies for the growers but they can't have adequate unemployment compensation for the workers. They treat him like a farm implement. In fact, they treat their implements better and their domestic animals better. They have heat and insulated barns for the animals but the workers live in beat-up shacks with no heat at all.

Illness in the fields is 120 percent higher than the average rate for industry. It's mostly back trouble, rheumatism and arthritis, because of the damp weather and the cold. Stoop labor is very hard on a person. Tuberculosis is high. And now because of the pesticides, we have many respiratory diseases.

The University of California at Davis has government experiments with pesticides and chemicals. To get a bigger crop each year. They haven't any regard as to what safety precautions are needed. In 1964 or '65, an airplane was spraying these chemicals on the fields. Spraying rigs they're called. Flying low, the wheels got tangled on the fence wire.

The pilot got up, dusted himself off, and got a drink of water. He died of convulsions. The ambulance attendants got violently sick because of the pesticides he had on his person. A little girl was playing around a sprayer. She stuck her tongue on it. She died instantly.

These pesticides affect the farm worker through the lungs. He breathes it in. He gets no compensation. All they do is say he's sick. They don't investigate the cause.

There were times when I felt I couldn't take it any more. It was 105 in the shade and I'd see endless rows of lettuce and I felt my back hurting . . . I felt the frustration of not being able to get out of the fields. I was getting ready to jump any foreman who looked at me cross-eyed. But until two years ago, my world was still very small.

I would read all these things in the papers about Cesar Chavez and I would denounce him because I still had that thing about becoming a first-class patriotic citizen. In Mexicali they would pass out leaflets and I would throw 'em away. I never participated. The grape boycott didn't affect me much because I was in lettuce. It wasn't until Chavez came to Salinas, where I was working in the fields, that I saw what a beautiful man he was. I went to this rally, I still intended to stay with the company. But something—I don't know—I was close to the workers. They couldn't speak English and wanted me to be their spokesman in favor of going on strike. I don't know—I just got caught up with it all, the beautiful feeling of solidarity.

You'd see the people on the picket lines at four in the morning, at the camp fires, heating up beans and coffee and tortillas. It gave me a sense of belonging. These were my own people and they wanted change. I knew this is what I was looking for. I just didn't know it before.

My mom had always wanted me to better myself. I wanted to better myself because of her. Now when the strikes started, I told her I was going to join the union and the whole movement. I told her I was going to work without pay. She said she was proud of me. (His eyes glisten. A long, long pause.) See, I told her I wanted to be with my people. If I were a company man, nobody would like me any more. I had to belong to somebody and this was it right here. She said, "I pushed you in your early years to try to better yourself and get a social position. But I see that's not the answer. I know I'll be proud of you."

All kinds of people are farm workers, not just Chicanos. Filipinos started the strike. We have Puerto Ricans and Appalachians too, Arabs, some Japanese, some Chinese. At one time they used us against each other. But now they can't and they're scared, the growers. They can organize conglomerates. Yet when we try organization to better our lives, they are afraid. Suffering people never dreamed it could be different. Cesar Chavez tells them this and they grasp the idea—and this is what scares the growers.

Now the machines are coming in. It takes skill to operate them. But anybody can be taught. We feel migrant workers should be given the chance. They got one for grapes. They got one for lettuce. They have cotton machines that took jobs away from thousands of farm workers. The people wind up in the ghettos of the city, their culture, their families, their unity destroyed.

We're trying to stipulate it in our contract that the company will not use any machinery without the consent of the farm workers. So we can make sure the people being replaced by the machines will know how to operate the machines.

Working in the fields is not in itself a degrading job: It's hard, but if you're given regular hours, better pay, decent housing, unemployment and medical compensation, pension plans—we have a very relaxed way of living. But the growers don't recognize us as persons. That's the worst thing, the way they treat you. Like we have no brains.

Now we see they have no brains. They have only a wallet in their head. The more you squeeze it, the more they cry out.

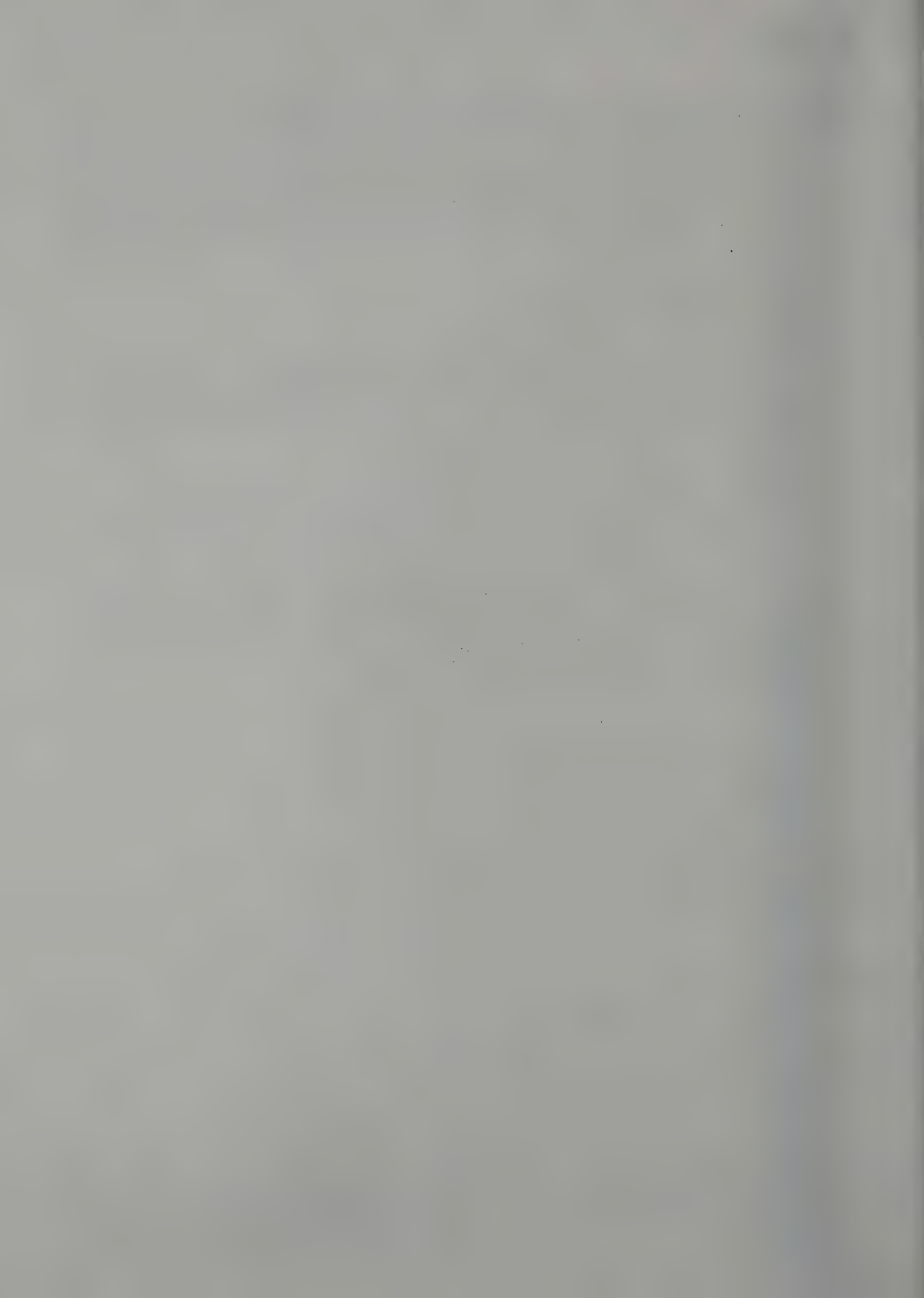
If we had proper compensation, we wouldn't have to be working seventeen hours a day and following the crops. We could stay in one area and it would give us roots. Being a migrant, it tears the family apart. You get in debt. You leave the area penniless. The children are the ones hurt the most. They go to school three months in one place and then on to another. No sooner do they make friends; they are uprooted again. Right

here, your childhood is taken away. So when they grow up, they're looking for this childhood they have lost.

If people could see—in the winter, ice on the fields. We'd be on our knees all day long. We'd build fires and warm up real fast and go back onto the ice. We'd be picking watermelons in 105 degrees all day long. When people have melons or cucumber or carrots or lettuce, they don't know how they got on their table and the consequences to the people who picked it. If I had enough money, I would take busloads of people out to the fields and into the labor camps. Then they'd know how that fine salad got on their table.

Questions for Analysis

1. *Initial Perceptions* What were Acuna's initial perceptions of being a migrant worker? Of his future goals? Of the growers? Of his fellow migrant workers?
2. *Experiences That Shaped His Initial Perceptions* What experiences shaped his initial perceptions about being a migrant worker? Of his future goals? Of the growers? Of his fellow migrant workers?
3. *Experiences That Raised Doubts and Questions About His Initial Perceptions*
 - a. How did becoming a foreman raise doubts about his initial perceptions?
 - b. How did becoming a correctional officer raise doubts about his initial perceptions?
 - c. How did meeting Cesar Chavez raise doubts about his initial perceptions?
4. *Revised Perceptions He Formed About His Situation* What were Acuna's revised perceptions of being a migrant worker? Of his future goals? Of the growers? Of his fellow migrant workers?



Recognizing Skills

CHAPTER

7

Purpose, Fact and Opinion, Tone, Bias, Organization, and Underlying Assumptions

Ben E. Johnson

Recognizing Purpose

RECOGNIZING PURPOSE:
identifying a writer's or speaker's
intention

What questions am I going to have answered in this section on recognizing purpose?

1. Why is it important to be able to recognize an author's or speaker's purpose?
2. What are the most common purposes of the books, publications, and lectures that we read and hear in college?
3. What are some easily recognized clues to a writer's or lecturer's purpose?

All speaking and writing has a purpose, and that purpose is tied very closely to the main point that the writer or speaker is attempting to make. The purpose is the reason for writing or speaking. Sometimes the purpose is identified by the speaker or writer, but frequently it is not. Instead, it is left up to the reader or the listener to recognize the purpose and then to use that knowledge to put what is said or written in proper perspective.

Think About This!

Not Three Wishes, Three Choices

You are exploring a deep cave in the mountains near Punjabi (Where?), and you stumble across what appears to be an Aladdin-type magic lamp. Maybe you can get three wishes, you think, so naturally you rub the lamp. Smoke billows out and in seconds forms into a magical being, a genie. The genie looks at you with a lopsided grin and says, "I know what you are thinking, and that only happens in stories and movies. We genies don't give three wishes, we give three choices. And here are yours. Take them or leave them.

"Choice one: You can have twenty healthy years added to your life with the condition that another person that you don't know (and never will know) will have twenty years lopped off his or her life. Do you want the extra years?"

"Choice two: You will receive \$100,000 if you agree to have a permanent, never-to-be-removed-or-covered-up 5-inch Nazi swastika tattooed on your right arm. Would you take the money?"

"Choice three: You can have a new skill or attribute if you give up a constructive skill or attribute. If you accept this choice, what skill or attribute do you choose and what do you give up?"

Writing and Speaking to Manipulate

Nearly always, the purpose of spoken and written communication is obvious. Authors and speakers deliberately make their intentions clear. Frequently (as in this book), the purpose is to modify our attitudes, actions, thoughts, or knowledge in some way. In a real sense, spoken and written communication—everything from newspaper and television advertising to scholarly articles in research journals—is manipulative. The degree of manipulation and the purpose are determined by the author.

Unsound Arguments Sometimes Fool Us

Sometimes a writer's or speaker's purpose is hidden from us and we can be manipulated if we are not alert. Purpose can be hidden behind unsound arguments. Some common types are listed for you below. You probably have already run into these, and you are likely to meet them again. Recognizing *sound* reasoning is often fairly difficult to do. Recognizing the common types of *unsound* reasoning (sometimes called *logical fallacies*) is fairly easy, once you are familiar with them. If you are aware of these fallacies and can spot them when you see or hear them, you will not be fooled by an unsound argument and a hidden purpose. Remember, your best tool for detecting unsound reasoning is always alertness on your part combined with your own common sense.

Common Logical Fallacies

1. *The stated conclusion is not necessarily a logical result of the facts presented. It is a non sequitur (Latin for "it doesn't follow").* Here is an example of this type of fallacy: "Joanne Benson has been an excellent high school principal, so she will make an excellent mayor for our city." If a person has been successful in one administrative position, it does not necessarily follow that the person will be successful in a different position. Common sense and your experience tell you that.
2. *An irrelevant point (a "red herring") is introduced to divert the reader's attention from the main issue.* The term *red herring* comes from the practice among escaping slaves or prisoners of dragging a smoked (reddish) herring or other strong-smelling fish across their trail to confuse the tracking dogs. If a writer is discussing the merits of a new novel and suddenly begins to condemn the sensationalism of tabloid newspapers, such a condemnation would be considered a red herring. The sensationalist newspapers have nothing to do with the novel.
3. *The writer evades the real issues by appealing to the reader's emotions. This is an argument ad populum ("to the people").* The writer uses words that have become emotionally charged in either a positive or a negative way: for example, *liberal, communist, honesty, American, and freedom*. A writer who says, "Only a communist would see the merit in electing him to office" is avoiding discussion

of the candidate's strengths and weaknesses and merely substituting an appeal to the emotions.

4. *An improper comparison is used as proof of a point. This is a faulty analogy.* Sometimes if you look closely at metaphors and extended comparisons you will see that the two things being compared are not really similar. An example of a faulty analogy would be arguing that a new law making it illegal to drink alcoholic beverages while piloting a boat is wrong because, if the state can prohibit that, it can just as easily make it illegal to drink alcoholic beverages while fishing from a dock. The two situations are not at all alike. Even though the analogy might suggest similarities (water, alcohol, law), it proves nothing.
5. *The writer attempts to convince the reader that the issue has only two sides—one right, one wrong. This is an either/or argument.* The statement “If you don’t vote to build the nuclear power plant, you won’t have any electricity” is irrational because it doesn’t mention other ways of generating electricity. One of the best-known (and popularly accepted!) examples of an either/or oversimplification was the 1960s bumper-sticker slogan that appeared on thousands of cars during the Vietnam War: “America: Love It or Leave It.” As we now see so clearly in hindsight, other choices were available.
6. *An argument is based on insufficient or unrepresentative evidence. This is a hasty generalization.* Suppose you have owned two parrots and both frequently bit you. If you declare that all parrots are vicious, you are making a hasty generalization, because thousands of parrots never bite anyone. If your generalization is based on an inadequate or unrepresentative sample (your own experience, for instance), it is invalid.
7. *An attempt is made to validate a point by saying something like “Everyone else believes this.” This is called bandwagon appeal.* This technique is merely an attempt to evade discussing the issue itself. We are especially familiar with this tactic in advertising. “Discriminating men use POW! cologne.” If “discriminating men” (like me, of course) use POW!, then it must be good, right? Wrong. Whether POW! is good or bad hasn’t even been addressed.
8. *An attack is made on a person’s character rather than on his or her argument. This is an argument ad hominem (“to the man”).* “Professor Goldsworthy can’t be a good psychology teacher because he’s divorced.” This claim is invalid because, in itself, Professor Goldsworthy’s marital status has nothing to do with his ability to teach psychology.
9. *Something is presented as truth that is supposed to be proven by argument. This is called begging the question, or circular thinking.* Take the statement “There aren’t enough seats in the auditorium because there are too many students.” In this case, the part of the statement that is supposed to prove the point simply repeats the point in different words. When a writer makes a point and offers “facts” to support it, without first proving the validity of the facts, the writer is using an invalid presentation. In the statement “All useless city property, such as the building on the corner of Ninth and Oak, should be sold,” the writer has already decided that the building is useless but has not taken responsibility for proving the point.
10. *The writer implies that because one event follows another in time, the first event caused the second. This is called post hoc reasoning, from the Latin post hoc ergo propter hoc (“after this, therefore because of this”).* Occasionally we are fooled and mistake a time connection for a cause-and-effect connection. Lending your car to your roommate did not cause your water pump to quit; lending the car merely preceded the failure in time. If you had been driving your car at the time, the pump would still have given out. Rely heavily on your common sense.

11. *An abstract concept is used as if it were concrete reality. This is called hypostatization.* Be wary if a writer uses statements like “Sociology shows us . . .,” “Literature illustrates . . .,” or “Science proves . . .” The writer is attempting to suggest that the abstraction represents all the experts in the field, who here speak with one voice. Of course, that voice agrees with the argument the writer is making. On the contrary, experts in sociology, literature, and science hold varied and even contradictory opinions.

Why Even Worry About Recognizing Purpose?

Often the writer’s or speaker’s purpose is innocent—perhaps simply to inform—but not always. Sometimes the speaker or writer has a different purpose—perhaps to persuade—and knowing this may affect your conclusions about what you are reading or hearing. Problems arise when a writer uses logical fallacies or other unsound reasoning, or fails to include a clear expression of purpose, and you believe the communication has one purpose when it really has a different one.

Being aware of the writer’s or speaker’s purpose *before, while, and after* reading or listening is a way of keeping ourselves from being fooled about the real message. In any communication, the author or speaker may or may not state his or her purpose outright, but it should always be discernible.

You develop skill in determining purpose when you regularly begin asking yourself questions like the following:

- ▶ Why did the writer write this, or why did the speaker say this?
- ▶ What was the writer of this passage trying to accomplish by telling us about this?
- ▶ Which words or terms best describe the writer’s or speaker’s purpose?

Thinkers

Limited Letters

Where do you see the following letters and no others?

C D E F L O P T Z

Need a Hint?

You’ve seen them before. They were just arranged differently.

The Most Common Purposes

Of the many purposes there are for writing and speaking, the ones you’ll discover most frequently in your college experience are listed here. Just reminding yourself of them from time to time will help you spot them. The first four purposes (marked with asterisks) are the most common purposes for writing. Expect to run into them frequently.

- | | |
|--------------------------|---------------------------|
| *to inform | to suggest an alternative |
| *to describe | to defend |
| *to tell a story | to entertain |
| *to convince or persuade | to discuss |

to state a problem
to analyze
to classify
to offer a solution
to achieve a combination
of purposes

to define
to compare
to evaluate
to present new information
to criticize
to move to action

Clues to Identifying Purpose

Identifying purpose is not as difficult as it may sound because often there are clues you can look for, such as the following:

1. *Statement of purpose.* Occasionally a writer or instructor will say something like “My purpose is . . .” Your responsibility then is to make certain as you read or listen that the stated purpose is the true purpose and not just a smoke screen. It is more likely, however, that the purpose will be implied, and you’ll have to look for other clues.
2. *Word clues.* Words or phrases like “This discussion is focused on . . .” also point to purpose, though less explicitly.
3. *Author’s tone.* The tone, or mood, of the passage may also give you a clue to a writer’s or speaker’s purpose. If the tone is humorous and lighthearted, then the author’s purpose is not likely to be a serious one. Watch for emotion-laden words; they are good clues.
4. *Titles, headings, boldface, and italics.* In textbooks and other nonfiction publications, titles, headings, and subheadings often give a clue to the author’s purpose. An article entitled “Recent Cognitive Research on Antisocial Juveniles” will probably have as its purpose to inform readers and not to entertain them. Bold-face type and italics often give clues to purpose by signaling mood, tone, importance, or emphasis.
5. *Introductions, summaries, and conclusions.* Often an author’s or instructor’s purpose is clearly indicated in brief introductions, summaries, and conclusions. Special attention should be paid to all of these.
6. *Author’s or speaker’s background.* A writer’s or speaker’s background can signal purpose very effectively. Knowing that a writer is the Grand Wizard of the Ku Klux Klan can help make you aware that the article he wrote entitled “The Role of Minorities in Building Our Nation” may not be as objective as the title suggests.
7. *Publication date.* Yes, the times do put a different slant on things, and *when* something was written often is a clue to its purpose. An article written in the 1950s on investing government funds in Japan will certainly have a different purpose than one written today. The opinion and the circumstances prevailing at the time the article was written may have changed by the time you read the material.

STIR IT UP 7.1

What’s the purpose? Read the brief article that follows, and then identify the writer’s purpose from the selections given. Watch for clues in the article—the correct choice will be obvious. Be ready to explain the reason for your answer.

Thinkers

The Bottle Problem

Can you build a platform on top of three bottles using only table knives? It can be done.



The rules: **(1)** Place each bottle upright at the corner point of a triangle having equal sides. **(2)** The distance between the bases of any two bottles must be *slightly more* than the length of a knife. **(3)** Use no more than four knives. **(4)** Knives may not touch the table or floor. Good luck.

Need a Hint?

You can't *think* your way through this, but you can *do* it. Get some bottles and try it. You'll be amazed at your inventive ability.

The Supply of Physicians

James R. Kearl

From the end of World War II until the mid-1960s, the proportion of active physicians in the population remained relatively stable. Since 1965, however, the physician–population ratio has risen from 1.4 to almost 2 per 1,000 population. Why the increase in supply?

Traditionally, the American Medical Association has carefully controlled entry into the medical profession by making it difficult for new medical schools to enter, limiting enrollment and expansion in existing medical schools, and working to ensure that states license only physicians who have graduated from AMA-accredited schools. As a consequence, incomes for physicians were high.

In the mid-1960s, federal and state governments began funding programs to encourage creation of new medical schools and expansion of old ones. At the same time, federal immigration laws were eased, making it easier for foreign doctors to enter the U.S. market. State licensing laws were relaxed. Finally, because of the high incomes, a fairly large number of U.S. students interested in studying medicine, but who could not get into U.S. medical schools, moved abroad to study (primarily to Mexico and places like Grenada).

As a result of these measures, it is estimated that there are 54,000 more physicians now than there would have been had pre-1965 conditions prevailed. Of these, 21,000 are foreigners who have benefited from easier immigration policies, 13,000 are foreigners who have entered because of relaxed licensing laws, and 20,000 are individuals who

have benefited from medical school expansion. In addition, this increase in supply reduced incomes for physicians by an estimated average of \$23,000 in 1981 dollars.

- | | |
|-----------------------------|---------------------------|
| _____ to convince, persuade | _____ to entertain |
| _____ to compare | _____ to criticize |
| _____ to analyze something | _____ to offer a solution |
| _____ to state a problem | _____ to evaluate |

STIR IT UP 7.2

How can skill with words hide an author’s purpose? Are some works so “well written” that readers don’t know they are being manipulated? When does such manipulation occur? Is it acceptable? Under what conditions? Address these issues in a one- or two-page essay.

STIR IT UP 7.3

Writers have many purposes, some of which seem to predominate in the materials you are expected to read in college. List the three purposes that you think are the most common in your study reading.

STIR IT UP 7.4

Are you aware of being manipulated by the ideas you are reading about *when you are reading*? Always? Sometimes? What determines your awareness during reading, and how do you respond? Where in your reading of a passage should you be able to make a judgment about the author’s purpose? Must you wait until you have finished reading to make a judgment? Jot down some answers to these questions below. Be ready to discuss your answers with your classmates.

Any Questions?

Sam the Thinker has a two-dollar bill and wants to buy a book that costs \$3. What can he do to turn that two-dollar bill into \$3 without borrowing the extra dollar or working for it? How many ways can you think of to accomplish this? In each case you think of for coming up with the extra dollar, who really ends up providing the extra dollar?

We Mustn't Open Drug-Use Floodgate

Dan Boatwright

Hometown: Concord, California.

Occupation/credentials: State senator, chairman of Senate Committee on Bonded Indebtedness, member of Joint Committee on Prison Construction; former assemblyman and member of Legislature since 1972; former mayor of Concord; former deputy district attorney in Contra-Costa County.

Education: Bachelor's degree in political science and law degree from UC-Berkeley, attended Vallejo Junior College.

Can you imagine walking into the local market with your children and seeing packages of cocaine marketed alongside cereal? How about grocery stores offering coupons—"Save \$1 on your next quarter gram of nose candy!" Or picture drug manufacturers and distributors offering promotional prizes—"Enter our sweepstakes and win two weeks in Bogota!"

How about the corner crack cocaine peddler telling his customer "That's \$10, plus 73 cents tax. The county road tax and special earthquake tax have knocked the price up a little."

Is this the kind of society we might have if drugs were legalized? I don't know. But I do know I'm not anxious to increase drug usage, and legalizing drugs will do just that.

Frankly, it continues to amaze me that some people argue that we ought to legalize drugs at least for people who would "register" as drug users, and use the taxes to finance treatment programs. It makes me wonder what they have been smoking.

When methadone (a heroin substitute) was legalized in Great Britain, the heroin problem was not curtailed. Instead, they now have methadone addicts in addition to their heroin junkies.

Does anyone really believe that the legalization of drugs will take the profits out of the hands of drug traffickers, funneling them instead into drug prevention and treatment?

Are we to assume that people who wish to use drugs would "register" as drug users? (I'm sure an employer would love to know if he or she had a "registered user" on the payroll!) And those who didn't register—can we assume they wouldn't make any attempt to buy drugs? Of course not.

And, once drugs have been legalized, do you think we can count on producers to pay state and federal taxes, warehouses to remit their property taxes and street-corner dealers to forward sales taxes?

Even in a simplistic world, the legalization of drugs doesn't make sense. It will cause consumption to go way up. In 1980, West Virginia allowed table wine to be sold in grocery stores rather than state liquor stores. During the first year, wine sales increased by 700 percent.

In fact, every state that has changed policies to make liquor more accessible has experienced a huge increase in consumption. What makes any rational person think the same increase wouldn't hold true for drugs?

The National Institute on Drug Abuse estimates that 14.5 million, or 7 percent of the over-12 population, uses illicit drugs. Even if we make a conservative estimate of a 300 percent increase in consumption under legalization, it would mean that more than 20 percent of our population would be drug users. What would this mean for society? It could mean more car wrecks because of stoned drivers, more spousal abuse and child neglect by addicted parents, more accidents on the job, more babies born addicted to drugs, more deaths from drug overdoses, and more cases of AIDS from heroin users sharing needles.

It would also mean that more of society's resources would go into rehabilitation for addicts, new health programs and lost job productivity.

The Research Triangle Institute of North Carolina estimated in 1988 that the national cost of drug abuse is \$100 billion. Approximately 30 percent of this amount, \$30 billion, is spent on law enforcement.

Even if enforcement costs were saved by legalization, it is estimated that the doubling or tripling of the other social costs would still bring the price up to \$140 billion to \$210 billion.

Drug legalization won't lessen our crime problems. Organized crime and black markets will not disappear, nor will other problems such as prostitution or theft as a means to get drug money. In fact, crimes like reckless driving and abuse would surely increase.

Now is not the time to back down, especially since drug trafficking has been shifting toward the West.

Passage of the Crime Victim's Justice Reform Initiative on the June ballot will result in a more efficient, speedier criminal process, and will enable us to get convicted drug dealers into prison sooner. Longer prison terms will keep them off our streets. Confiscation of their personal property will deny them some of the tools of their trade.

We need to use all of our energies right now to fight drugs. We shouldn't be diverting our energies into conjuring up methods of legalization.

Progress has been made. Drug-awareness programs in the 1980s have helped to bring about a decrease in the number of people using drugs. After spending years trying to convince our youngsters to "say no" to drugs, it would be devastating to suddenly tell them "it's OK after all."

I've personally seen too many victims of drugs. I don't care to hear another innocent infant, born to a drug-addicted mother, cry helplessly in the midst of a heroin withdrawal.

I don't want my children's children to grow up in a society where harmful drugs are marketed like candy. I don't think you do either.

EXAMINE YOUR THINKING ABOUT WHAT YOU JUST READ

Pay attention to your thinking processes as you answer the following questions.

1. What is this author's conclusion concerning the legalization of drugs? Aside from the strong suggestion in the title, at what point in the article did you know what the conclusion was? How did you know?
2. Of the many arguments in this article for not legalizing the use of drugs, some are based on facts and some merely appeal to our emotions. In fact, if you were in favor of legalizing drug use, you might say that some of the arguments are fallacious, or at least weak. What are some of the weaker arguments in this article? What makes them weak? What would make them stronger?
3. If you were to attack this article and its conclusion, how would you go about it? How important is recognizing the author's underlying assumptions to successfully analyzing what is being stated?
4. Were you persuaded by the argument in this article? If so, were you easily persuaded? What is the strongest argument the author makes for not legalizing drug use? Is this argument made early or late in the article? Before reading the article, did you have an opinion concerning the legalization of drugs, or did the article help you to make a decision?

WRITE ABOUT THIS

In a short essay, give your opinion concerning the legalization of drugs. Describe when and how you formed your opinion and what arguments most influenced your thinking. Also describe the conditions under which your opinion might change. Could there be some middle ground between the advocates on both sides of the issue?

To Be or Not to Be Single

Leslie Milne

Today's society presents a woman with the choice of whether to marry or remain single. Such a choice was not a practical option for women even one generation ago. It is worth examining the pros and cons of married versus single life for the modern young woman.

First impressions do much to recommend the single life. Freedom is, for many, the most attractive feature of singlehood. Your time is your own. You need answer to no one but yourself, in the form of your conscience. You are at liberty to take full advantage of opportunities in both career and romance when they arise. In addition, you may have as many sex partners as suits you at any given time.

As an independent, self-reliant person, you are in charge of your own life. You can be an assured, confident individual to whom others relate as such, rather than as "his other half." You can be secure in your ability to stand on your own two feet, rather than constantly worrying whether or not you could ever really manage without him.

As a single woman, there is less pressure on you to adhere to the role models ascribed by society. For instance, you don't have to cook, clean, have babies, and generally evolve your lifestyle to cater to the needs and desires of another. If you choose to live on pizza and TV dinners for a week, you can do it without affecting anyone else.

The single lady often holds mystery and allure for the attached male. Your friends' partners are apt to find you infinitely attractive and flirt outrageously with you. This is such a delightful ego-booster, and it tends to make you glow all the more appealingly.

Even if heavily involved with someone, as a single woman you retain the option of cutting loose, changing your mind, and resuming life on your own. That important escape route is always clear. You can avoid the stigma of divorce and all the damage which results from such a status move.

It certainly does seem that marriage would be rather a drag. Apart from all the hassle of making a commitment, there is the inevitably dull routine of it all. Also, for every one thing you adore about him, there are ten things that drive you nuts. How much better to enjoy the fun side of a relationship, and see a man on his best behavior, trying desperately to impress you on a date.

But wait! Is this a satisfactory way to live the rest of your life? Surely the flip side of the coin merits at least some examination. It may require the magical appearance in your life of the elusive Mr. Right, but somewhere down the line you are going to be confronted with at least the idea of marriage. It may be a friend who is taking the plunge, or perhaps your current partner is popping *the* question. Suddenly, life as a single girl is put into a whole new perspective.

In the middle of celebrating your treasured freedom, you realize that you are often lonely. You are tired of friends and colleagues taking advantage of you because you have freedom from family responsibilities. Why would it matter if *you* worked later or over the weekend? Such experiences in the past have made you become quite selfish about your own time. Do others consider you promiscuous for having more than one boyfriend, or for dating lots of men over the course of the past year? Worse yet, are you in risk of being infected with the AIDS virus?

Far from being regarded as self-reliant and independent, you seem to be coming across as a threat to potential partners who can't see what they could possibly offer you. As time goes on and you remain single into your late thirties, men may regard you as unable or unwilling to commit to a serious relationship, or may even believe that you are gay. All this undermines your confidence and sparks feelings of paranoia: What is wrong with me? Why are men avoiding me like the plague?

Not having to cater for anyone else is all very well, but with only yourself to cook and clean for, it is easy to let everything slide until you are suddenly and painfully aware that you look like a slob and live like a pig. Far from seeming attractive to the husbands and partners of your friends, you may come to be regarded as a "third wheel," a real nuisance who is always tagging along. Women suspect you of flirting, while men resent you for cramping their style with their own partners.

Avoidance of intimacy can lead to a string of superficial, nonprogressive relationships which evaporate after the first flush of lust is over. Unwillingness to commit to anyone signals fear of taking risks to many potential marriage partners.

Even after divorce, a once-married person often holds a lot of appeal. At least he or she tried, even if it didn't work out. Surveys reveal that the majority of divorced people do remarry at some stage. Surely these people are not "lemmings," repeatedly hurling themselves over the cliff to certain death. Marriage really must have a lot going for it.

There is no doubt that getting close enough to someone to recognize him—"warts and all"—leads to a deeper, truer, more meaningful love relationship. Such a union holds satisfaction, many rewards, and the real promise of enduring happiness. Wouldn't it be cozier to share your pizza or TV dinner with some less-than-perfect, but eminently familiar person? Dates are fun, but the continuity, security, true intimacy, and closeness resulting from a marriage partnership deserve serious consideration as cause to rethink your attitude toward that widely debated status.

While the single life may be infinitely more appealing to some, the benefits and long-term rewards of marriage provide, on balance, the greatest satisfaction for the majority of people.

READ AND RESPOND

1. All writing has a purpose—at least all published writing. What would you say the purpose was for writing this article? Why do you think so? At what point did you first begin to sense that this was the purpose? At what point was that feeling confirmed?
2. Is this writing biased in any way, or would you characterize this article and the reasoning as basically objective? What evidence supports your conclusion?
3. Is what is written true? For example, how accurate would you consider this statement: "There is no doubt that getting close enough to someone to recognize him—'warts and all'—leads to a deeper, truer, more meaningful love relationship." Is this always true, sometimes true, or only true in movies? What about the other assertions? Are they accurate and fair?
4. Did the writer leave any arguments out? What are they?
5. What is your conclusion? Be objective, especially if you happen to be in love at the moment. Is it better to be married or single?

Why Do Japanese Workers Stay in Their Jobs Longer Than U.S. Workers Do?

James R. Kearl

Job turnover among Japanese workers in manufacturing industries is lower than it is for their counterparts in the United States. The monthly turnover in Japan is 0.9 percent of the manufacturing workforce; turnover in the United States is 3.5 percent. Some of the difference may be due to culture, but there are good economic reasons for the differences as well. Japanese turnover is low because Japanese workers receive much more on-the-job training than U.S. workers do. Much of this training is specific to the firms for which the workers are employed. That is, the training makes the worker more productive at a specific firm, but it does not enhance his or her productivity as much if he or she chooses to go to another firm. As a consequence, Japanese workers become attached to their firms. It has been estimated that 60 percent of the difference in turnover rates is caused by these differences in on-the-job training.

Why do the Japanese choose to provide this additional training? Since the early 1950s, the rate of technological change has been much greater in Japan than in the United States. This more rapid rate of change requires continuous training and retraining of workers. (In the period prior to World War II, when Japanese technology changed at a much slower rate than it did later, the turnover rate was considerably higher than it is today, and hence, much closer to that of the United States.)

It has also been found that Japanese workers who interrupt their careers for extended periods of time suffer larger wage declines than those in similar circumstances in the United States do. This suggests that there is more rapid obsolescence of skills in Japan, again because of rapid technological change.

READ AND RESPOND

1. What questions are raised by this article? What inferences are made?
2. What is the real reason—that is, the reason *behind* the reasons given in the article—that Japanese workers don't leave their jobs?
3. Considering what you have just read and what you already know about the American job scene, what can you conclude about the opportunity for advancement in the Japanese manufacturing industry compared with that in the American manufacturing industry?
4. Do you find the Japanese training and employment practices described here a positive factor or a negative factor? What does your answer say about your values?

Asking Critical Questions

After you read the article that follows, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the article in proper context and to completely understand what is being said or reported? *On the lines following the article, write three questions that, if answered, will help you understand what is really being said.*

Invoice Costs and Prices

James R. Hearl

Consider the pricing problem of a jeweler when the price of gold fluctuates. Suppose, to simplify matters, that a jeweler has an inventory of rings, each weighing one ounce, each made of pure gold, and each purchased at a time when the price of gold was \$350 per ounce. The jeweler has, for accounting and tax purposes, an invoice indicating the cost of acquiring her current inventory. The invoice indicates that each ring cost \$350. What will happen to the price of rings if the world price of gold increases from \$350 per ounce to \$700 per ounce?

In approaching this kind of question, you ought to first ask what the opportunity costs are. To do so, you need to first determine what the opportunities are. In this case, the jeweler could sell rings either as jewelry or the rings could be melted and sold for their gold content. That is, if a jeweler sells rings to persons wanting jewelry, the jeweler gives up the opportunity of selling the gold in the ring on the world market at \$700. Therefore, the opportunity cost of selling a ring for jewelry is \$700, not \$350. Even though the jeweler has not had to pay any additional amount of money for her inventory of rings, when the world price of gold increases, the jeweler's costs of operating the jewelry store increase, in this case quite substantially, and the price of rings should increase commensurate with the increase in cost.

Even though the jeweler has an invoice indicating that the cost per ring is \$350, this invoice "cost" is not the opportunity cost of selling a ring. Costs are determined by *current* opportunities, not opportunities that were once available but which no longer can be chosen. Put differently, *opportunity costs are determined only by choices that can actually be made*. Choices that cannot actually be chosen cannot affect opportunity costs. The only opportunities currently facing the jeweler are to sell rings or to sell the gold in rings. Hence, the cost of selling rings is the best forgone opportunity, which is selling gold at \$700.

The price of gold may, of course, decrease instead of increase. For instance, consider the jeweler's costs when the world price of gold declines to \$200 per ounce. Once again, she can either sell the rings as gold on the world gold market or as jewelry. The cost of choosing to sell them as jewelry is now \$200. The jeweler's opportunity cost has declined. The price of rings will also decline. Won't the jeweler lose money? Yes, but this does not affect the opportunity cost of selling rings. If the jeweler tries to sell rings for \$350, she will be undersold by other individuals, because they can stock their inventories at \$200 per ring. Therefore, the jeweler will confront the choice of selling no (or very few) rings for at least \$350, or selling the entire inventory of rings priced at \$200 per ounce, either as jewelry or as gold. Hence, less money will be lost by selling rings at \$200 per ounce than if efforts were made to sell rings for something greater than \$200.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Recognizing Fact and Opinion

RECOGNIZING FACT AND OPINION:
Distinguishing between a
statement of fact and a statement
of opinion

What questions am I going to have answered in this section on recognizing fact and opinion?

1. What is the most important difference between a fact and an opinion?
2. Under what circumstances is it possible for a fact to be incorrect?
3. What guidelines are there for differentiating between a fact and an opinion?
4. Is it possible to have a statement that is neither fact nor opinion, or that is both?

In order for you to be as successful in college (and after college) as you can be, you will need to be able to determine the value of what you read and hear. You must be able to decide whether you should accept or reject new information, or seek additional information. In order to do this, you must develop habits of *questioning and evaluating* while reading and listening, and you must become adept at distinguishing between statements of fact and statements of opinion.

Students who do not think critically assume that because a statement appears in a textbook or journal article, or is spoken by a professor or by a “good” student, that statement is automatically a fact. This cannot be assumed to be the case. To be an efficient thinker and decision maker, you will need to know if you are being presented an opinion, a fact, or fact and opinion combined. Once you are able to differentiate in this way, you will be able to draw proper conclusions about what you have read or heard. As you study and learn, keep questions similar to the following in mind:

- ▶ Where can I check to see if this is really true?
- ▶ Is this a mixture of fact and opinion?
- ▶ How is my judgment of a person’s credibility affected if I know he or she is stating an opinion as if it were a fact?

Think About This!

What Was That Again?

Wise people, and even some not so wise, have said some wonderfully quotable things. Usually, however, they become so memorable because they are boiled down to their essence and may even be a bit difficult to really understand. Read the quotations below and then after you have thought about what was said, resay them in your own words. What are they *really* saying?

- “It takes a very long time to become young.” (Pablo Picasso)
 - “Freedom of will is the ability to do gladly that which I must do.” (Carl Jung)
 - “The only way to get rid of temptation is to yield to it.” (Oscar Wilde)
 - “Nothing comes of doing nothing.” (William Shakespeare)
 - “Only the ephemeral is of lasting value.” (Eugene Ionesco)
 - “There is nothing so unthinkable as thought unless it be the entire absence of thought.” (Samuel Butler)
 - “Every decision you make is a mistake.” (Edward Dahlberg)
 - “The word ‘water’ is itself undrinkable, and the formula H_2O will not float a ship.” (Alan Watts)
-

The Important Difference Between Fact and Opinion

Determining the difference between fact and opinion is usually not difficult if you keep in mind two important guidelines:

1. *A fact is anything that can be validated or proved.* If a statement can be proved right or wrong by measurement or testing, it is a fact. The following statements are facts because they can be verified, frequently with one or more of our senses.

The bird has an injured wing.

It is 1,180 miles to Port Huron, Michigan, from Anna Maria Island, Florida.

That delicious smell comes from baking cinnamon rolls.

2. *An opinion cannot be validated.* If no validation can be achieved, if no right or wrong can be established, the statement is an opinion. An opinion is what a person *believes*. A person may attempt to *justify* an opinion in some way or to *provide some degree of support* for it, but if a statement cannot be validated, it is still an opinion. A statement is an opinion when there is no way to check its accuracy.

Statements of Opinion

Statements of opinion express an author's or speaker's *impressions, beliefs, and judgments* about something. *Opinions cannot be judged true or false, or right or wrong*, because they are a person's individual impressions about something. This truth gives rise to the familiar statement, "You have the right to your own opinion."

Keep in mind that an opinion is not necessarily *incorrect*—it just hasn't been proved. An opinion may seem true, in fact it may be exactly what you believe, but *if it can't be proved or hasn't yet been proved*, it is still an opinion.

The following are statements of opinion. Do you understand why?

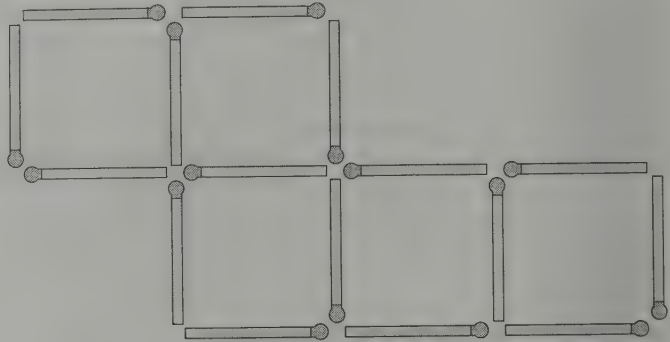
- ▶ President Clinton's election angered more Americans than has any other election of a president.
- ▶ Checkers' baconburger with cheese is the best hamburger for the money in the country.
- ▶ Mickey the cat is much more loving than Annie the dog.
- ▶ Anna Maria Island has the best beaches in North America.
- ▶ People in California are more sophisticated thinkers than people in Florida.
- ▶ The school reform movement will never accomplish its goals.

These sentences present statements of opinion about real things, but they are unverifiable.

Thinkers

Match This!

Move only two matches and create four squares instead of five.



Need a Hint?

Get some matches and move them around. You'll end up with four squares.

Statements of Fact

Statements of fact present information without interpreting it. They imply neither judgment nor evaluation. Unlike statements of opinion, statements of fact can be verified in records or historical or scientific documents, or by means of tests or measurements.

These are statements of fact. Do you understand why?

- ▶ Carmel, California, has twenty-four bed-and-breakfast inns located within one square mile.
- ▶ The temperature inside the car after one hour in the sun is 130 degrees.
- ▶ My grandchildren, Nicholas, Jaida, and Ryan, all have blue eyes.
- ▶ Over 300,000 people died in the Bosnian fighting during the final two years.
- ▶ The other Ben Jonson died in 1641.
- ▶ The sticker price of that car is \$16,898, but you can buy it for \$12,000.

You are able to *verify* the accuracy of each of these statements by going to source books, doing measurements, or consulting authorities. The statements are therefore statements of fact. Incidentally, even though these are all statements of fact, some of them contain *incorrect* information.

The following guidelines will help you determine what is a statement of fact.

1. Statements that can be proved or disproved are still statements of fact even when they are in error and proved false. A statement of fact, then, is not always accurate or correct. It could very easily be an *incorrect* statement of fact; for example, "Three hundred and twenty-seven parents from twenty-two schools attended last night's school board meeting" (there were 342 parents from 21 schools, and the meeting was two nights ago).

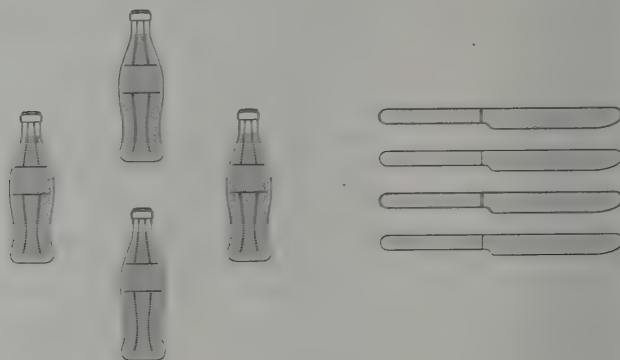
2. Statements that present evaluations, attitudes, or probabilities are statements of opinion, because they cannot be proved true or false. Statements of opinion are often presented in an authoritative voice, and may be true, but they are still statements of opinion: for example, “Not enough people care about protecting the environment to ensure any positive change.”
3. Statements dealing with persons, places, objects, occurrences, or processes that exist or did exist, and which can be proved or disproved, are statements of fact: for example, “In last night’s class I showed a film about methods of teaching poetry at the middle school level.”
4. Statements about future events are statements of opinion even when the events seem likely to occur: for example, “Eventually, there will be a cure for AIDS.” (This probably will come to pass, but perhaps it won’t. Because the statement deals with the future, it can’t be validated in the present.)
5. Statements of fact often use concrete words referring to things, events, or measurable characteristics. Words such as *gallon*, *salt water*, *twenty-two years*, *56 millimeters*, *cumulus clouds* are all concrete words.
6. Statements of opinion frequently rely on abstract words. Abstract words refer to things that can’t be touched or measured, such as *faith*, *love*, *hope*, *courage*, *patriotism*, *health*. Because these words cannot be *specifically* defined and limited, people use them to mean different degrees of the same thing, or even to mean something completely different. As we all know from personal experience, the word *love* may mean one thing to one person and another thing to somebody else.
7. Watch for clue words and phrases in statements of opinion. Frequently you can spot value-judgment words such as *good*, *bad*, *unattractive*, *necessary*, *quality*; opinion phrases such as *I believe*, *it appears*, *we suggest*; or emotion-laden words such as *loving*, *generous*, *warm*, *honest*, *filthy*, *decadent*, *evil*. These words and phrases should tip you off to the probability that opinion, not fact, is being presented.
8. Cultivate a spirit of healthy skepticism about what you read and hear in college. Start asking yourself, or others, questions like, Where’s the proof? Who says? and even, What is the significance of that? if the answers are not apparent.
9. Beware of expert opinion disguised as fact. Don’t be unduly impressed by what experts say. The opinions of experts in any field may be more valuable and credible than opinions by nonexperts, and they need to be taken seriously, but without validation they are still opinions.

Statements of Fact and Opinion

Frequently what we read and hear is a *mixture* of fact and opinion, as illustrated by the following example: “I failed my biology quiz today, and I will fail it again tomorrow.” “I failed my biology quiz today” is a statement of *fact* that can be verified. “I will fail it again tomorrow” is a statement of *opinion* that cannot be verified because tomorrow hasn’t come.

Thinkers

The Four-Bottle Problem



Construct a platform on top of *four* bottles, using only four knives. Each bottle is placed upright at the corner of a square. Each side of the square is slightly longer than a knife, so that a knife fits easily between the bases of any two adjacent bottles. *All four bottles must be used.*

Need a Hint?

What you learned with the three-bottle problem will work with four bottles.

STIR IT UP 7.5

Now that you know that statements of fact can be objectively verified in a number of ways, determine which of the statements below are statements of fact. For each statement of fact, indicate how you could go about verifying it. For each statement of opinion, briefly indicate why it would be impossible to verify. If a statement contains both fact and opinion, indicate which part of the statement is which.

1. Orchids are the most beautiful flowers in the world.

2. Construction workers are better protected from injury than children at playgrounds.

3. The production of electromagnetic waves with frequencies greater than radio waves is accomplished by molecular excitation, but the process is hard to duplicate.

4. On any given night, an estimated 735,000 people in the United States are homeless and without hope.

5. By and large, drug use among teens is limited to a few types of drugs. Use of other drugs may occur sporadically, but it does not usually last long. What is curious is that the most widely used drug, alcohol, is often viewed with the least alarm by adults.

STIR IT UP 7.6

What do statements of opinion that are presented as if they were statements of fact suggest to you? Clearly explain what you think by giving examples where possible.

STIR IT UP 7.7

Relate a sad or amusing anecdote in which you believed a statement was fact and found out it was opinion. Jot down the "facts" of that story below and be ready to share it with the class.

STIR IT UP 7.8

Think about this and then write your conclusions below. What do you do when you read? Discuss what you think occurs that gets the meaning of the words on a page turned into meaning in your mind. Is the meaning in your mind the same as the author's intended meaning? How and why does the meaning stay in your memory?

STIR IT UP 7.9

Give short answers (where possible) to the following questions:

1. Are opinions ever valuable, or are facts the only things worth reading and remembering?

2. Do opinions ever become facts? If so, under what circumstances?

3. What three things did you read in this book so far that you think you *should* remember? What did you learn that is so important that you *want* to remember it always?

Welfare as a Women's Issue

Johnnie Tillmon

I'm a woman. I'm a black woman. I'm a poor woman. I'm a fat woman. I'm a middle-aged woman. And I'm on welfare.

In this country, if you're any one of those things—poor, black, fat, female, middle-aged, on welfare—you count less as a human being. If you're all those things, you don't count at all. Except as a statistic.

I am a statistic.

I am 45 years old. I have raised six children.

I grew up in Arkansas, and I worked there for fifteen years in a laundry, making about \$20 or \$30 a week, picking cotton on the side for carfare. I moved to California in 1959 and worked in a laundry there for nearly four years. In 1963 I got too sick to work anymore. Friends helped me to go on welfare.

They didn't call it welfare. They called it A.F.D.C.—Aid to Families with Dependent Children. Each month I got \$363 for my kids and me. I pay \$128 a month rent; \$30 for utilities, which include gas, electricity, and water; \$120 for food and nonedible household essentials; \$50 for school lunches for the three children in junior and senior high school who are not eligible for reduced-cost meal programs.

There are millions of statistics like me. Some on welfare. Some not. And some, really poor, who don't even know they're entitled to welfare. Not all of them are black. Not at all. In fact, the majority—about two-thirds—of all the poor families in the country are white.

Welfare's like a traffic accident. It can happen to anybody, but especially it happens to women.

And that is why welfare is a women's issue. For a lot of middle-class women in this country, Women's Liberation is a matter of concern. For women on welfare it's a matter of survival.

Forty-four percent of all poor families are headed by women. That's bad enough. But the *families* on A.F.D.C. aren't really families. Because 99 percent of them are

headed by women. That means there is no man around. In half the states there really can't be men around because A.F.D.C. says if there is an "able-bodied" man around, then you can't be on welfare. If the kids are going to eat, and the man can't get a job, then he's got to go. So his kids can eat.

The truth is that A.F.D.C. is like a supersexist marriage. You trade in a man for the man. But you can't divorce him if he treats you bad. He can divorce you, of course, cut you off anytime he wants. But in that case, *he* keeps the kids, not you.

The man runs everything. In ordinary marriage, sex is supposed to be for your husband. On A.F.D.C., you're not supposed to have any sex at all. You give up control of your own body. It's a condition of aid. You may even have to agree to get your tubes tied so you can never have more children just to avoid being off welfare.

The man, the welfare system, controls your money. He tells you what to buy, what not to buy, where to buy it, and how much things cost. If things—rent, for instance—really cost more than he says they do, it's just too bad for you.

There are other welfare programs, other kinds of people on welfare—the blind, the disabled, the aged. (Many of them are women too, especially the aged.) Those others make up just over a third of all the welfare caseloads. We A.F.D.C. are two-thirds.

But when the politicians talk about the "welfare cancer eating at our vitals," they're not talking about the aged, blind, and disabled. Nobody minds them. They're the "deserving poor." Politicians are talking about A.F.D.C. Politicians are talking about us—the women who head up 99 percent of the A.F.D.C. families—and our kids. We're the "cancer," the "undeserving poor." Mothers and children.

In this country we believe in something called the "work ethic." That means that your work is what gives you human worth. But the work ethic itself is a double standard. It applies to men and to women on welfare. It doesn't apply to all women. If you're a society lady from Scarsdale and you spend all your time sitting on your prosperity paring your nails, well, that's okay.

The truth is a job doesn't necessarily mean an adequate income. A woman with three kids—not twelve kids, mind you, just three kids—that woman earning the full federal minimum wage of \$2.00 an hour, is still stuck in poverty. She is below the Government's own official poverty line. There are some ten million jobs that now pay less than the minimum wage, and if you're a woman, you've got the best chance of getting one.

The President keeps repeating the "dignity of work" idea. What dignity? Wages are the measure of dignity that society puts on a job. Wages and nothing else. There is no dignity in starvation. Nobody denies, least of all poor women, that there is dignity and satisfaction in being able to support your kids through honest labor.

We wish we could do it.

The problem is that our country's economic policies deny the dignity and satisfaction of self-sufficiency to millions of people—the millions who suffer everyday in underpaid dirty jobs—and still don't have enough to survive.

People still believe that old lie that A.F.D.C. mothers keep on having kids just to get a bigger welfare check. On the average, another baby means another \$35 a month—barely enough for food and clothing. Having babies for profit is a lie that only men could make up, and only men could believe. Men, who never have to bear the babies or have to raise them and maybe send them to war.

There are a lot of other lies that male society tells about welfare mothers; that A.F.D.C. mothers are immoral, that A.F.D.C. mothers are lazy, misuse their welfare checks, spend it all on booze and are stupid and incompetent.

If people are willing to believe these lies, it's partly because they're just special versions of the lies that society tells about all women. . . .

On TV, a woman learns that human worth means beauty and that beauty means being thin, white, young and rich.

She learns that her body is really disgusting the way it is, and that she needs all kinds of expensive cosmetics to cover it up.

She learns that a "real woman" spends her time worrying about how her bathroom bowl smells; that being important means being middle class, having two cars, a house

in the suburbs, and a minidress under your maxicoat. In other words, an A.F.D.C. mother learns that being a “real woman” means being all the things she isn’t and having all the things she can’t have.

Either it breaks you, and you start hating yourself, or you break it.

There’s one good thing about welfare. It kills your illusions about yourself, and about where this society is really at. It’s laid out for you straight. You have to learn to fight, to be aggressive, or you just don’t make it. If you can survive being on welfare, you can survive anything. It gives you a kind of freedom, a sense of your own power and togetherness with other women.

Maybe it is we poor welfare women who will really liberate women in this country. We’ve already started on our welfare plan.

There would be no “categories”—men, women, children, single, married, kids, no kids—just poor people who need aid. You’d get paid according to need and family size only—\$6,500 for a family of four (which is the Department of Labor’s estimate of what’s adequate), and that would be upped as the cost of living goes up.

If I were president, I would solve this so-called welfare crisis in a minute and go a long way toward liberating every woman. I’d just issue a proclamation that “women’s” work is *real* work.

In other words, I’d start paying women a living wage for doing the work we are already doing—child-raising and house-keeping. And the welfare crisis would be over, just like that. Housewives would be getting wages, too—a legally determined percentage of their husband’s salary—instead of having to ask for and account for money they’ve already earned.

For me, Women’s Liberation is simple. No woman in this country can feel dignified, no woman can be liberated, until all women get off their knees. That’s what N.W.R.O. is all about—women standing together, on their feet.

Along with other welfare recipients, we have organized together so we can have some voice. Our group is called the National Welfare Rights Organization (N.W.R.O.). We put together our own welfare plan, called Guaranteed Adequate Income (G.A.I.), which would eliminate sexism from welfare.

READ AND RESPOND

1. Have you had any experience with welfare, or do you know people who have had to depend on some form of welfare? If so, how do your or their experiences relate to the experiences described in this article? Are they similar or different?
2. How valid is the opinion expressed in this article? How good is the evidence? Does your agreement with the opinion have anything to do with your own values? Explain your answer.
3. What do you think about the suggestion to pay women for being mothers and homemakers? Would this end welfare, extend welfare, or do something else? Is it even possible?
4. This article is crammed with information, some in the form of fact and some in the form of opinion. Go back over the article. As you do so, write the letter *F* at the end of lines that contain statements of fact and the letter *O* at the end of lines that contain statements of opinion. Where both are present, put both *O* and *F*. Does this article include more fact or more opinion? Do you have an opinion as to whether or not most of the statements of fact are correct or incorrect?

Reinforcing Good Health Habits with Money

James R. Kearl

In the past few years, many firms have built gyms at factories and business sites, provided “healthy heart” alternatives in cafeterias, and put scales in washrooms—all to encourage more healthful lifestyles among their employees. Now, however, a number of firms are providing a straightforward incentive for good health: money.

By not smoking, agreeing to buckle their seatbelts, and participating in health-promotion workshops, employees of the Bank of Delaware receive \$6 per month. This amount increases to \$9 per month for employees who are willing to get a fitness evaluation or follow a prescribed exercise plan, and to \$12 per month for employees who participate in both programs. U-Haul employees can earn up to \$130 dollars per year for specified healthful behavior. Similar programs at Baker-Hughes net employees \$120 per year; at ICH, \$180 per year; at Southern California Edison, \$120 per year. Gosnell Builders’ employees can earn from \$96 to \$552 per year, and Coors offers a 5 percent reduction in coinsurance payments.

Since 1988, the state of Kansas has reduced health insurance premiums by \$10 per month for employees who pledge not to smoke for one year. Southern California Edison’s program sets standards for weight, blood pressure, cholesterol, blood sugar, and lung carbon monoxide. Those who meet the standards—or who pledge to work toward meeting the standards—receive \$10 per month. The payoff for Southern California Edison? Employees who met the standards had average health bills of \$1,273 in 1989, while those at risk in three of the areas had health bills of \$2,284.

Of course, incentives can be both enticements and penalties. Although it had previously paid all health insurance premiums, Texas Instruments decided to charge employees and their dependents \$10 per month for health insurance (up to \$30 per family) if they use any form of tobacco. An internal study indicated that health claims of tobacco users were 50 percent higher than those of nonusers.

READ AND RESPOND

1. Is there a conclusion stated in this article, or is the article simply a listing of data? If there is a stated conclusion, underline it.
2. Is the conclusion implied but not stated? If so, what is it?
3. What are the reasons, illustrations, or evidence supporting the conclusion?
4. Are there any underlying assumptions in the article? Does the writer perhaps assume that readers will understand the relationship between money and health? What might the writer assume?
5. Go back over the article, and write F at the end of lines that contain statements of fact and O at the end of lines that contain statements of opinion. Are there more statements of fact or statements of opinion? Do you get a feel for whether or not most of the statements of fact are correct or incorrect? Are the statements of opinion persuasive? If so, what makes them persuasive?

Asking Critical Questions

After you read the articles that follow, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the articles in proper context and to completely understand what is being said or reported? *On the lines following each article, write three questions that, if answered, will help you understand what is really being said.*

Fight Until Complete Victory!

Hồ Chí Minh

Compatriots and fighters throughout the country!

The barbarous U.S. imperialists have unleashed a war of aggression in an attempt to conquer our country, but they are sustaining big defeats.

They have rushed an expeditionary corps of about 300,000 men into the southern part of our country. They have used a puppet administration and a mercenary army fostered by them as instruments of their aggressive policy. They have resorted to extremely savage means of warfare—toxic chemicals, napalm bombs, and so forth. With such crimes they hope to subdue our southern compatriots.

But under the firm and wise leadership of the NFLSV [National Front for the Liberation of South Vietnam, or NLF], the South Viet-Nam army and people, closely united and fighting heroically, have scored very glorious victories and are determined to struggle until complete victory with a view to liberating the South, defending the North, and subsequently achieving national reunification.

The U.S. aggressors have brazenly launched air attacks on North Viet-Nam in an attempt to get out of the quagmire in the South and to impose negotiations on us on their terms.

But North Viet-Nam will not falter. Our army and people have shown redoubled eagerness in the emulation to produce and fight heroically. So far we have blasted out of the skies more than 1,200 aircraft. We are determined to defeat the enemy's war of destruction and at the same time to extend all-out support to our dear compatriots in the South.

Of late the U.S. aggressors hysterically took a very serious step further in the escalation of the war: They launched air attacks on the suburbs of Hanoi and Haiphong. That was an act of desperation comparable to the agony convulsions of a grievously wounded wild beast.

Johnson and his clique should realize this: They may bring in 500,000 troops, 1 million, or even more to step up the war of aggression in South Viet-Nam. They may use thousands of aircraft for intensified attacks against North Viet-Nam. But never will they be able to break the iron will of the heroic Vietnamese people to fight against U.S. aggression, for national salvation. The more truculent they are, the further they will aggravate their crime. The war may still last ten, twenty years, or longer. Hanoi, Haiphong, and other cities and enterprises may be destroyed, but the Vietnamese people will not be intimidated! Nothing is more precious than independence and freedom. When victory day comes, our people will rebuild our country and endow it with bigger and more beautiful construction.

It is common knowledge that each time they are about to step up their criminal war, the U.S. aggressors always resort to their peace talks swindle in an attempt to fool world opinion and blame Viet-Nam for unwillingness to enter into peace talks!

President Johnson! Reply publicly to the American people and the peoples of the world: Who has sabotaged the Geneva Agreements which guarantee the sovereignty, independence, unity, and territorial integrity of Viet-Nam? Have Vietnamese troops invaded the United States and massacred Americans: Is it not the U.S. Government which has sent U.S. troops to invade Viet-Nam and massacre the Vietnamese?

Let the United States end its war of aggression in Viet-Nam, withdraw from this country all U.S. and satellite troops, and peace will return here at once. . . .

The Vietnamese people cherish peace, genuine peace, peace in independence and freedom, not sham peace, American peace.

For the defense of the independence of the fatherland and for the fulfillment of our obligation to the peoples struggling against U.S. imperialism, our people and army, united as one man, will resolutely fight until complete victory, whatever the sacrifices and hardships may be. In the past we defeated the Japanese fascists and the French colonialists in much more difficult junctures. Today the conditions at home and abroad are more favorable; our people's struggle against U.S. aggression for national salvation is sure to win a total victory.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

The Evacuation of Saigon (1975)

Al Santoli

The evacuation of Saigon, the whole thing, was called Operation New Wind or Fresh Wind or Fresh Breeze or something like that. We got to the aircraft carrier *Midway*, and as soon as we got off the helicopter—since I was a surgical tech, my hair was always under a cap and it was rather long, about halfway down my ears—the CO [commanding officer], who was up in the tower, comes down and says, “Get those guys down for haircuts.” So right away he gets on us for haircuts. The *Midway* was our base of operations. Our surgical equipment, all the green crates, never did catch up to us. That’s known throughout the military, that they never catch up with you, and the *Midway* didn’t have an operating room. This is about April 10 or 11.

We were real close to shore at that time, right off Saigon. We heard that we were taking on a whole bunch of civilians. We would be flying in and out with refugees, with American personnel, with reporters. The Tan Son Nhut airport was being bombed with big rockets. You could see the explosions from the sea. We were flying in and taking on refugees, and they were flying out whatever they could. With the refugees there were worms, women going into labor, TB and wounded lying on the choppers because there were a lot of shells coming in. There were a couple dead or dying on the chopper whom we couldn’t save. We were landing in Tan Son Nhut. That was our staging point, where everybody was loading.

There were people coming out in boats, half-sinking boats. There were people who had their own airplanes who were flying out. There were all these choppers we had left there; they were using these to fly out, the Vietnamese. The flight deck was so full of choppers that we had to push them overboard because there was no room, we couldn’t get our own choppers in. We were flying the big medevac choppers. We had an overload, packing in about twenty-five at a time, both Vietnamese and American. It was total chaos. The Purple Heart Trail, the road that came into Saigon from the paddies west of the city, was so jammed, from the air I could see columns of people that were at least twenty miles long. A lot of children crying. Some had clothes they picked off dead bodies. Most were barefoot. There were oxcarts and they were hauling what they had. There were wounded men on both sides of the road with battle dressings on. The NVA was lobbing these rockets all over the place, they were wiping out civilians . . . There were piles of wounded on the back of ambulances. They were dropping the rockets right into crowds of fleeing people. There were trucks, buses, anything they could get into. Saigon was the last stand, the capital, where the American embassy was.

A lot of American Marines were activated and had put up a perimeter guard around Tan Son Nhut. The NVA was still lobbing these rockets in. In fact, when I took off we were also flying out from the American embassy—a lot of people had been told to go there instead of Tan Son Nhut. It was really a mess. These rockets are lobbing in and a C-130 took off full of people going out to one of the aircraft carriers and it was

blown out of the sky . . . that was all over the runway. There were corpses, there were burned-out tanks that people had used to come in, there were pieces of bodies lying in the fields and on the streets. It was just bananas, total chaos. It was one mess of humanity being pushed to where people were being trampled. People screaming, "I want a place on this chopper!" and not being able to communicate because of the language barrier and because they would not listen.

They were raiding the American Exchange. The image I have is this one guy holding up one of those ten-packs of Kellogg's cereal and he's waving it. They were throwing American money up in the air . . . totally berserk . . . total chaos. We were trying to get the wounded first. They were piled in these old ambulances. The refugees were coming up from the Delta as well as from the North. We were trying to get the wounded out first and a lot of them we just couldn't.

Each time we went in, a bunch of Marines would get out and cover the landing zone as we tried to get the wounded on first, but sometimes they were just overwhelmed. They had orders to shoot if they couldn't maintain order. They shot mostly over the heads. I didn't see any of the Marines shoot any civilians. The Marines set up a defensive perimeter and would return fire at the enemy, but like the rest of the war, you never saw the NVA. The ARVN were running, they were coming in, they were bypassing civilians, shooting civilians, trying to get out first all the time. The best way to describe it was every man for himself. There were pregnant women going into labor right there on the goddam landing zone. I delivered a baby right on the chopper. And I also delivered two more on the ships. It was just bananas.

We ended up with three thousand civilians aboard the *Midway*. We had taken all of our squadrons off because they had been there for offensive purposes. The civilians all stayed where the squadrons used to be. There were people sleeping on the floors, all over. Of course, they didn't know what a bathroom was. They were packed in, I'll tell you that. So we'd all take turns walking duty and if someone was puking or if someone had diarrhea or worms, we'd treat that.

On April 30 Saigon fell. South Vietnam had fallen. The Vice-President, Ky, flew out to the *Midway* in his own Cessna. Ky had with him an immense amount of gold bars. A lot of these people, some of the higher-ups in the ARVN and so on, had with them a lot of American money. We confiscated everything from civilians when they came on board. There were pounds and pounds of pure heroin, pounds and pounds of nice marijuana, which I really wanted to sample. People had little cherry-bomb grenades. We picked up guns. A lot of canned fish had to be tossed out. A lot of fever, they had a lot of malaria. So we had these three thousand people packed in there. That was the best we could do.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Recognizing Tone

What questions am I going to have answered in this section on recognizing tone?

RECOGNIZING TONE: Identifying a sentiment or mood by assessing the writer's or speaker's choice of words

1. What is tone in writing and speaking?
2. Why is recognizing tone such an important thinking skill?
3. What are some common words used to convey tone?

The ability to recognize a speaker's or writer's tone is a critical thinking skill that is not difficult to master. Your professors often ask you questions about assigned readings or talks, such as, "What is the tone (or mood, or feeling) the writer or speaker creates in his or her statements?" or simply, "What is the tone of this work?" Your professors expect you to be able to recognize the *attitude* the writer or speaker takes toward the material he or she discusses. That attitude can be anything: lighthearted or malicious, ironic or gentle, or any number of others.

For example, when I set out to write this book, I knew that it had to be serious in tone because I wanted students to take it seriously. I knew that I wasn't going to be writing a funny book (although the book would include some humorous things) or a scary book (there is nothing scary about this book—I hope). Also, I didn't want the book to have a heavy, "textbookish" tone. Therefore, I have attempted to keep the tone of this book light enough to encourage continued easy (even enjoyable) reading but serious enough to convey the importance of the subject matter. When writing, rewriting, and editing, I measured what I was writing against my desired tone.

You want to develop your ability to recognize tone so that you routinely ask and answer questions like these about what you read and hear:

- ▶ Is this talk or piece of writing disapproving, angry, or mocking?
- ▶ What mood was the writer of this passage in when she or he wrote it?

Think About This!

"Did you hear the one about. . . ?"

Because you are in college you are accustomed to serious discussions with serious people about serious subjects. However, at times humor can stir up your thinking just as effectively as serious critical thinking. In fact, in order to even find humor in a joke, you are required to use many of your critical thinking skills. Humor forces you to look at things in a new light or from a different point of view. Your curiosity is aroused, you look for multiple levels of meaning, and you reject the literal meaning of words and statements. "Funny" people are frequently described as being spontaneous, unconventional, playful, and flexible—important characteristics also found in the most creative thinkers.

Even bad humor makes you think. It may not make you laugh, but it stirs up your thinking. In order to even recognize bad humor, you must be able to look beyond the literal meaning of words. For example:

Why did the orange stop in the middle of the road? It ran out of juice.

I know that a train just passed because I can see its tracks.

"I was shot in the arm." "Have a scar?" "No thanks, I don't smoke."

The atomic scientist told his friends he was going on vacation to do some fission.

Do you have cold winters in Arkansas? No, just Hot Springs.

How do ghosts like their eggs? Terrified.

Did you know that *smiles* is the longest word in the English language? There is a mile between the first and last letters.

"I just married a fine Irish lad." "Oh, really?" "No, O'Reilly."

Stir up your critical thinking skills by creating more atrocious humor. Don't just restate something you've heard before. Create something new. Perhaps your instructor will offer a reward to the student who can create the worst joke.

Why Is Recognizing Tone Important?

Identifying authors' and speakers' attitudes about what they say can tell you a great deal about their *purpose*. The feelings and attitudes of speakers and writers toward the ideas they express greatly influence word choice and emphasis. You, as listener or reader, should be aware of how the author or speaker feels so that you can read or listen critically and objectively, putting the ideas, facts, and opinions expressed in perspective. If the tone in a statement is one of ridicule and irony, the author or speaker may be trying to turn you against the person, event, or idea that is being discussed. If the tone is earnest, formal, or sympathetic, then perhaps the author intends to encourage your support of some cause or idea.

Tone Is a Clue to Purpose

The two short paragraphs that follow illustrate different tones and show how tone is an important clue to an author's or speaker's purpose.

The school board's policy on absenteeism has proved to be as liberal and unthinking as it was when it traded choice land to corporations and industrialists rather than preserve it as sites for future schools.

The school board has an established policy to trade or sell large sections of valuable land to manufacturing and industrial corporations in exchange for commitments to provide future school sites and fund the building of schools located in planned growth areas of the county.

In the first paragraph, the author uses a condemning tone in discussing the school board's policy. The words *liberal* and *unthinking* are meant to create an unfavorable attitude in the reader.

In the second paragraph, the words *established*, *commitments*, and *planned* create a positive and accepting tone, clearly designed to encourage the reader to approve of what is said.

Don't Let Tone Confuse You

The idea of tone often puts students off because they may think it hard to define. You ought to think of tone merely as the impression you have of the author's or speaker's attitude toward his or her subject. Tone in a written passage is similar to tone in music. The same words you use to describe the mood created by a piece of music (sad, intimate, light-hearted, uneasy) are the same words you use to describe the tone in a reading passage or spoken address.

Thinkers

Make a Man

Add two lines to the numbers below and make a man.

11030

Need a Hint?

How's your spelling?

Common Tone Words

You face no real difficulties in learning to identify tone in a reading. The most difficult task is coming up with a word or phrase that fits the tone as you recognize it. One good way (and about the only way) to become more proficient at recognizing the author's tone is to become familiar with a lot of "tone words."

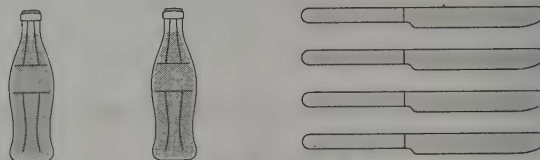
The following list contains a selection of common tone words. Place a check mark next to any word whose meaning you are not sure of, and look up the words in a dictionary. Doing so will increase your vocabulary of tone words and will help you appraise the tone in a passage more accurately.

Tone Words

disapproving	frustrated	awestruck	distressed
cruel	melancholy	wondering	sensational
serious	formal	ridiculous	ironic
vindictive	playful	intimate	gentle
amused	intense	hard	detached
malicious	reverent	impassioned	irreverent
farcical	sympathetic	mocking	reticent
prayerful	righteous	pathetic	cynical
loving	solemn	outspoken	ambivalent
optimistic	condescending	arrogant	indignant
evasive	objective	obsequious	critical
angry	apathetic	satiric	cheerful
joyous	nostalgic	outraged	grim
condemning	celebratory	incredulous	uneasy

Thinkers

The Two-Bottle Problem



Use only two soda bottles. The bottles must be upright, their bases separated by one-and-a-half times the length of a table knife. Using only four knives, erect between the two bottles a bridge/platform that will hold a glass of water.

Need a Hint?

A variation of the method used for the other bottle problems will work here.

STIR IT UP 7.10

Can you think of contemporary slang or colloquial tone words that are not included in the preceding list? What are they, and what do they express? How about *nerdy*? Think of others. What words, if any, did they replace?

STIR IT UP 7.11

Think about the tone of your college reading materials. Does the tone vary from one text to another, or is it about the same? Are there any materials in which the tone seems to change periodically, maybe even drastically? List your classes, and indicate (1) the general tone of the class, (2) the tone or tones of the textbook or textbooks.

STIR IT UP 7.12

What is the tone of this chapter? Of this book so far?

STIR IT UP 7.13

If you were asked to explain as clearly as possible just what tone is, what would you say?

STIR IT UP 7.14

Identify the three most important pieces of information this chapter should include on the thinking skill of identifying tone. Write one sentence for each piece of information.

a.

b.

c.

I Just Wanna Be Average

Mike Rose

Students will float to the mark you set. I and the others in the vocational classes were bobbing in pretty shallow water. Vocational education has aimed at increasing the economic opportunities of students who do not do well in our schools. Some serious programs succeed in doing that, and through exceptional teachers—like Mr. Gross in *Horace's Compromise*—students learn to develop hypotheses and troubleshoot, reason through a problem, and communicate effectively—the true job skills. The vocational track, however, is most often a place for those who are just not making it, a dumping ground for the disaffected. There were a few teachers who worked hard at education; young Brother Slattery, for example, combined a stern voice with weekly quizzes to try to pass along to us a skeletal outline of world history. But mostly the teachers had no idea of how to engage the imagination of us kids who were scuttling along at the bottom of the pond.

And the teachers would have needed some inventiveness, for none of us was groomed for the classroom. It wasn't just that I didn't know things—didn't know how to simplify algebraic fractions, couldn't identify different kinds of clauses, bungled Spanish translations—but that I had developed various faulty and inadequate ways of

doing algebra and making sense of Spanish. Worse yet, the years of defensive tuning out in elementary school had given me a way to escape quickly while seeming at least half alert. During my time in Voc. Ed., I developed further into a mediocre student and a somnambulant problem solver, and that affected the subjects I did have the wherewithal to handle: I detested Shakespeare; I got bored with history. My attention flitted here and there. I fooled around in class and read my books indifferently—the intellectual equivalent of playing with your food. I did what I had to do to get by, and I did it with half a mind.

But I did learn things about people and eventually came into my own socially. I liked the guys in Voc. Ed. Growing up where I did, I understood and admired physical prowess, and there was an abundance of muscle here. There was Dave Snyder, a sprinter and halfback of true quality. Dave's ability and his quick wit gave him a natural appeal, and he was welcome in any clique, though he always kept a little independent. He enjoyed acting the fool and could care less about studies, but he possessed a certain maturity and never caused the faculty much trouble. It was a testament to his independence that he included me among his friends—I eventually went out for track, but I was no jock. Owing to the Latin alphabet and a dearth of Rs and Ss, Snyder sat behind Rose, and we started exchanging one-liners and became friends.

There was Ted Richard, a much-touted Little League pitcher. He was chunky and had a baby face and came to Our Lady of Mercy as a seasoned street fighter. Ted was quick to laugh and he had a loud, jolly laugh, but when he got angry he'd smile a little smile, the kind that simply raises the corner of the mouth a quarter of an inch. For those who knew, it was an eerie signal. Those who didn't found themselves in big trouble, for Ted was very quick. He loved to carry on what we would come to call philosophical discussions: What is courage? Does God exist? He also loved words, enjoyed picking up big ones like *salubrious* and *equivocal* and using them in our conversations—laughing at himself as the word hit a chuckhole rolling off his tongue. Ted didn't do all that well in school—baseball and parties and testing the courage he'd speculated about took up his time. His textbooks were *Argosy* and *Field and Stream*, whatever newspapers he'd find on the bus stop—from the *Daily Worker* to pornography—conversations with uncles or hobos or businessmen he'd meet in a coffee shop, *The Old Man and the Sea*. With hindsight, I can see that Ted was developing into one of those rough-hewn intellectuals whose sources are a mix of the learned and the apocryphal, whose discussions are both assured and sad.

And then there was Ken Harvey. Ken was good-looking in a puffy way and had a full and oily ducktail and was a car enthusiast . . . a hodad. One day in religion class, he said the sentence that turned out to be one of the most memorable of the hundreds of thousands I heard in those Voc. Ed. years. We were talking about the parable of the talents, about achievement, working hard, doing the best you can do, blah-blah-blah, when the teacher called on the restive Ken Harvey for an opinion. Ken thought about it, but just for a second, and said (with studied, minimal affect), "*I just wanna be average.*" That woke me up. Average?! Who wants to be average? Then the athletes chimed in with the clichés that make you want to laryngectomize them, and the exchange became a platitudinous melee. At the time, I thought Ken's assertion was stupid, and I wrote him off. But his sentence has stayed with me all these years, and I think I am finally coming to understand it.

Ken Harvey was gasping for air. School can be a tremendously disorienting place. No matter how bad the school, you're going to encounter notions that don't fit with the assumptions and beliefs that you grew up with—maybe you'll hear these dissonant notions from teachers, maybe from the other students, and maybe you'll read them. You'll also be thrown in with all kinds of kids from all kinds of backgrounds, and that can be unsettling—this is especially true in places of rich ethnic and linguistic mix, like the L.A. basin. You'll see a handful of students far excel you in courses that sound exotic and that are only in the curriculum of the elite: French, physics, trigonometry. And all this is happening while you're trying to shape an identity, your body is changing, and your emotions are running wild. If you're a working-class kid in the vocational track,

the options you'll have to deal with this will be constrained in certain ways: You're defined by your school as "slow"; you're placed in a curriculum that isn't designed to liberate you but to occupy you, or, if you're lucky, train you, though the training is for work the society does not esteem; other students are picking up the cues from your school and your curriculum and interacting with you in particular ways. If you're a kid like Ted Richard, you turn your back on all this and let your mind roam where it may. But youngsters like Ted are rare. What Ken and so many others do is protect themselves from such suffocating madness by taking on with a vengeance the identity implied in the vocational track. Reject the confusion and frustration by openly defining yourself as the Common Joe. Champion the average. Rely on your own good sense. Fuck this bullshit. Bullshit, of course, is everything you—and the others—fear is beyond you: books, essays, tests, academic scrambling, complexity, scientific reasoning, philosophical inquiry.

The tragedy is that you have to twist the knife in your own gray matter to make this defense work. You'll have to shut down, have to reject intellectual stimuli or diffuse them with sarcasm, have to cultivate stupidity, have to convert boredom from a malady into a way of confronting the world. Keep your vocabulary simple, act stoned when you're not or act more stoned than you are, flaunt ignorance, materialize your dreams. It is a powerful and effective defense—it neutralizes the insult and the frustration of being a vocational kid and, when perfected, it drives teachers up the wall, a delightful secondary effect. But like all strong magic, it exacts a price.

READ AND RESPOND

1. How would you describe the author's tone in this article? What tone does he use when he describes his vocational education teachers? Who is the author writing for? Is the intended audience people who went to vocational schools? Or, perhaps, is the intended audience people who are highly educated?
2. What is the author's attitude toward his vocational education teachers? What is his attitude toward the other students?
3. Is this author mentally deficient in any way? Does he appear to have been socially troublesome in his earlier education? What led to his "not knowing things" and ending up in vocational education classes?

Clinical Trial of Azidothymidine (AZT) in the Treatment of AIDS

Joseph Levine and Kenneth Miler

Hypothesis

The drug azidothymidine (AZT) is effective in the treatment of acquired immune deficiency syndrome (AIDS).

Background

AIDS is caused by a virus that cripples the body's ability to fight disease. . . . Most people infected with this virus die of *opportunistic infections*, diseases that the body normally fights off but that ravage people with AIDS. Once afflicted with full-blown AIDS (as defined at the time), patients have no hope of survival without treatment. AZT first showed promise by interfering with the reproduction of the causative virus in test-tube experiments. Preliminary trials in seriously ill patients were not conclusive.

Experimental Design

This experiment, sponsored by the manufacturer of AZT, was a double-blind, randomized, placebo-controlled study. Obviously, researchers did not inject healthy individuals with the virus; persons already infected by the virus were asked to volunteer. A computer-generated code randomly assigned each subject to receive either AZT or a placebo. Neither the subjects nor the researchers evaluating their condition knew which patients received AZT. The placebo itself was designed to look and taste just like AZT. Subjects were asked not to take any other medications without the permission of the researchers. No other treatment to prevent or control opportunistic infections was permitted to either experimental or control subjects during the course of the study. Data were rigorously analyzed by advanced statistical methods to determine whether differences between experimentals and controls could have been due to chance alone. . . .

Ethical considerations weighed heavily in experimental design. The study was approved by committees at each of 12 participating medical centers across the country. An additional independent board was established to review the study data on a regular basis. It was this group's responsibility to protect the subjects if it appeared that AZT was causing unacceptable toxic side effects. This board also kept watch for any sign that the drug was clearly benefiting those who received it. Every subject signed a consent form certifying that he or she understood the risks and benefits of the procedure. (Imagine the courage of these participants; they knew that half of them were voluntarily forgoing treatment that might save or prolong their lives. They did so in order to help produce evidence about whether or not the drug worked.)

Results

Because many of the data from this experiment deal with complex phenomena that we will not cover until later, we will present only the most basic results here. Figure 1.14(a) and (b) show the number of patients who developed opportunistic infections during the treatment period. Figure 1.14(a) shows results among those people with full-blown AIDS; Figure 1.14(b) shows similar information for subjects with the less severe illness then called AIDS-related complex (ARC). Note that in both groups subjects receiving AZT had a lower rate of opportunistic infections than did those receiving the placebo. Table 1.2 shows that AZT recipients also had significantly higher chances of surviving the 24-week treatment period. Additional data indicated that AZT caused side effects of varying severity in different subjects. Side effects ranged from muscle aches, insomnia, and nausea to serious anemia and the loss of certain classes of white blood cells.

Conclusions

This study indicated that AZT produced the best short-term results of any medication available for AIDS treatment at the time it was conducted. Researchers therefore recommended the use of AZT in the treatment of AIDS and AIDS-related complex (ARC) in patients who could tolerate its side effects.

READ AND RESPOND

1. Does the conclusion stated necessarily follow from the design and results of this experiment? Why or why not?
2. How would you summarize the ethical concerns at the heart of this study?
3. What do you think the subjects with full-blown AIDS were thinking when they agreed to participate in this study? Could they have been thinking several things? What are the possibilities?
4. What might the subjects with AIDS-related complex have been thinking about their participation in this study?
5. What makes you think that this study is a valid, reliable, genuine study and not just something that the author of this text made up?

Asking Critical Questions

After you read the article that follows, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the article in proper context and to completely understand what is being said or reported? *On the lines following the article, write three questions that, if answered, will help you understand what is really being said.*

A Few Kind Words About Creative Strategy

Howard Shank (Advertising Executive)

It seems to be in the nature of creative people to chafe at those little pieces of paper entitled "Creative Strategy."

To watch a lot of creative people react, you'd think those documents were really headed, "Creative Straitjacket." Or, "Arsenic. Take full strength. Do not dilute."

There is, to be sure, some reason for this revulsion. It is not unheard of for writers and art directors to be asked to execute something that should really be called an "uncreative strategy."

The authors of these papers have been known to be neither creative nor strategic in their thinking and to mask a certified non-idea behind formularized words. If you execute such a non-idea, what you are bound to have is a noncompelling advertisement. No matter how cleverly you write and visualize.

Which is too bad for all concerned.

Especially the client (who may be expected, if presented with too many non-thoughts, to become a *nonclient*).

Basic truth, you folks: the highest form of creativity in advertising is the setting of *real* creative strategies.

We must never forget it.

It's what built this business.

It's where your future and my future lie.

It's where at least half the joy in our business is found.

It's also where the hardest work is found, I'll admit. But don't forget, you always love hard work. Afterwards.

If you're still with me, I'd like to tell you what a real creative strategy is.

But first, I'll suggest to you some of the things it is *not*.

It is not just a sentence that says, "The advertising will convince people that our product is the (tastiest) (freshest) (mildest) (hardest-working) (classiest) (fastest) product in the store."

It is not the product of logic and analysis alone—although they're part of how you get there.

It is not the province of the client or the account man—although they should be heavily involved.

It is not a jail for creative execution. Rather, if you've got a real creative strategy, it will inspire you to write and visualize at the height of your powers.

It is not aimed at robots but at human beings with hearts and guts as well as brains.

The last sentence is the crux of the matter.

The real creative strategy is the one that relates product to yearnings. Formula to life style. Performance to passions.

If you can look at a thinner cigarette and see it not only as a special cigarette for women but also as a symbol of equality for women, you can create real creative strategies.

If you can look at a bar of soap with pumice in it and see not only an efficient hand washer but also the solution to the problem of "Public Dirt," you can create real creative strategies.

If you can look at a glass of chocolate milk and see it not as just a yummy thirst-quencher or a hunger-fighter but as a cure for a kid's "thungries," you can create real creative strategies. (Some of our smart people did that just the other day.)

In all truth, the process that leads to real creative strategies is the process that leads to inventions.

It involves the seeing of old facts in new relationships.

It involves the discovery of needs and wants in people that even the people may not have discovered in themselves. (Hardly anyone knew he needed a telephone until A. G. Bell came along.)

It also involves hard work. As I said before.

When you have a creative strategy problem on your plate, you are confronted by a need to know everything you can get your hands on. About the product itself. About competitive products. About the market: its habits, its attitudes, its demographics. About the advertising history of the category.

You need to study all the research you can get your hands on.

You need to ask questions until people hate to see you coming.

You need, in short, to dig, dig, dig.

The dismal truth is that your chances of finding a compelling creative strategy are in direct proportion to how much information you stuff your head with.

If you are working on a new coffee, say, you will wind up knowing more about coffee than you ever thought you wanted to know.

There is a very good reason why you must do this human sponge act if you are to invent real creative strategies.

Your subconscious mind—where a very important part of the invention process goes on—needs a richly-stocked data bank to do its best work.

The job of your subconscious is to review and re-review everything you know about a subject. It searches, even during your sleep, for new relationships between people and products; searches, as I suggested earlier, for new combinations of old ideas; searches for the new insight that can give even a very old product the right to ask for new attention in the market.

If you stint your subconscious on the input side, it will surely stint you on the output.

Creative strategy goes around in the world under several pseudonyms: basic concept, basic selling idea, product positioning, basic selling proposition.

But whatever the name, the purpose of real creative strategizing is simple and vital: the invention of a big idea.

I said earlier that *this* kind of creative strategy work is the highest form of creativity in advertising.

I believe it wholeheartedly.

I also believe wholeheartedly in the power of brilliant execution.

What I believe in most of all is the synergism you create when you couple a big idea with brilliant words and pictures.

When you can do that regularly, you can't help getting rich and famous. Not to mention happy in your work.

One final thought. If you don't have the habit already, make close business friends of every client, every client service man, every research man you can. Pick their brains. Push them for information. Involve them heavily in your invention work.

Their input can—and very likely will—make all the difference in your output.

MY CRITICAL QUESTIONS

1.

?

2.

?

3.

?

Recognizing Bias

What questions am I going to have answered in this section on recognizing bias?

1. What is bias, and why is it important to be able to recognize it in writing and speaking?
2. What are five common signs that bias is present?
3. How do I *bring* bias to what I hear, read, and study?

RECOGNIZING BIAS: Noting the presence and nature of a writer's or speaker's prejudice

Probably now more than ever before in this century, we are bombarded by propaganda of all sorts. Radio and television personalities have made a career out of being biased. Is there any question as to the political loyalties and biases of Ross Perot, Rush Limbaugh, Newt Gingrich, or Jesse Jackson? They are aware of the truth of the advertising maxim, "It's not just *what* you say, it's also *how* you say it." Politicians and public relations experts are adept at molding public opinion on political and social issues.

By the time we get to college we are generally aware that the public media are "loaded" with bias, that is, with a predisposition, prejudice, or prejudgment. We see bias especially in such things as commercials, political speeches, and even pep talks by religious and charitable fundraisers. They are loaded with words and phrases that play upon our emotions in order to move our thinking—and thus our actions—in a specific direction. The task for the careful thinker is to be aware of the word choices and to avoid being unthinkingly moved by their persuasive power.

The presence of bias has become routine in much of what we read and hear. In fact, we take bias so much for granted that we usually don't even think about its

presence unless our emotions are strongly touched in some way, and then we *may* question the cause. It is important for us as thinkers to realize that what we see, hear, and read all through life is usually *not* fair and unbiased—even in college.

Think About This!

Even Menus Make You Think

What we eat and drink reflects more than just what tastes good to us. What we eat and drink also reflects important social customs. People ate different things during different historical periods. As you read the following menu that was reported in a Paris newspaper on December 4, 1870, try to imagine the conditions or events that might make such a menu possible. Write down some of the possibilities. According to the newspaper, these foods were eaten at a banquet for the leading figures of French society. That certainly makes you think, doesn't it?

- ▶ Consommé of horse with birdseed
- ▶ Skewered dog liver, maitre d'hôtel
- ▶ Minced cat's back, mayonnaise sauce
- ▶ Shoulder of dog, tomato sauce
- ▶ Dog cutlets with peas
- ▶ Ragout of rats Robert
- ▶ Dog leg flanked by ratlets
- ▶ Escarole salad
- ▶ Elephant's ear au jus
- ▶ Plum pudding with horse marrow
- ▶ Dessert and wines

Possible circumstances:

Check the end of this chapter for the circumstances that led to this menu.

And, while you're at it, try creating a "diet for the twenty-first century." What will we be eating?

Thinkers

Even if you don't know a word of Latin, you should be able to read and understand the following poem:

O sibili, si ergo,
Fortibus essen ero.
Ono sed bili themis trux.
Sivat sinem, causor dux.

Need a Hint?

Read the poem slowly out loud to someone. What did your listener hear?

Bias in Textbooks, Lectures, and Life

We seldom think of questioning statements that we hear in lectures or read in textbooks or journals. We seldom wonder if the professor or author is unbiased in presenting facts. We should be more questioning, because it is possible that bias in a lecture, journal article, or textbook may negate its value.

We need to pay close attention not only to the ideas and facts presented, but also to the words used to express them. Being sensitive to the language in a presentation matters just as much as being aware of the facts presented and the logic behind them. Often a writer's or speaker's words reveal a bias that springs from an attempt to influence the reader or listener. The writer or speaker may be trying to get people to like or dislike, agree or disagree with, support or refute a cause. In the relatively innocent questions that follow, do you notice the particular *slant* that is designed to bring about a particular response?

- ▶ Do you really believe that the state government has a right to invade your private life by requiring that you fill in and return that questionnaire?
- ▶ Do you approve of making the community suffer by depriving it of a place to dump waste, just to protect a moth?
- ▶ Wouldn't you really rather trust a think tank than a group of politicians?

In some reading matter, such as newspapers and magazines, writers attempt to influence our thinking and behavior in overt ways. Some newspapers and magazines, as well as some journalists, have widely recognized reputations for being biased, primarily because of the liberal or conservative stands they take on issues. Nothing is wrong with this "fixed" bias unless you allow yourself to be unknowingly influenced. Being unable to tell that bias lurks in college lectures and assigned readings is a severe handicap. Accepting every bit of information and interpretation without question will result in confusion.

The Need to Detect Bias

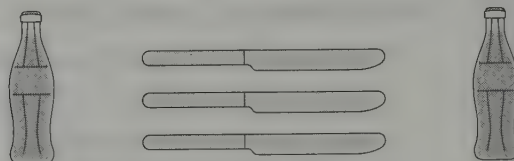
In order to be skillful and efficient thinkers we need to be able to detect bias and allow for it when we evaluate what is written or said. We ought to develop an attitude that routinely causes us to raise questions similar to these:

- ▶ Did the writer of this piece seem to like the social worker, the police officer, the single parent, or the child best?
- ▶ Which is more likely to be fair and objective, this newspaper or my psychology textbook?

- ▶ What makes me feel that the instructor is biased in her presentation of the events?
- ▶ Is the sample in this study representative? Does it have the same characteristics in the same proportion as the target population?
- ▶ Are these experts affiliated with any interest groups? Do they subscribe to a cause?

Thinkers

Another Two-Bottle Problem



Use only two upright soda bottles. The distance between the bottles must be one and a half times the length of a table knife. Using only *three* knives, construct a bridge from one bottle to the other. Remember: The bridge must be strong enough to hold a glass of water, and the knives may not touch the table.

Need a Hint?

You probably no longer need hints for these bottle problems. So there isn't one.

How to Recognize Bias

Bias is often present when a writer's choice of words arouses the reader's emotions, but it is *always* there when the material includes one or more of these elements:

1. *Name-calling* (for example, "The military officer was not able to continue speaking because of irresponsible interruptions by several ill-mannered, unkempt weirdos.")
2. *Contradictions* (for example, "Our charitable organization is in no trouble at all. The recent scandal will blow over, and people will resume their donations.")
3. *Highly emotional, even inflammatory statements* (for example, "We all feel the same way: let them go back where they came from and stop causing trouble in our community. They don't belong here with normal people.")
4. *False assumptions based on weak or inaccurate information* (for example, "Asian refugees have a hard time adjusting to Western society because they are used to being told when to do everything, and in this country people are free to do whatever they want to do.")
5. *Stereotyping, often with inaccurate overgeneralizations* (for example, "Everyone knows that men make much better airline pilots than women.")

Keep in mind that biased writing may be very interesting to read and biased speaking may be very interesting to listen to because of the colorful, emotional language designed to sway you. This doesn't mean you should be suspicious of all interesting speaking and writing, but you should heighten your sensitivity to bias.

STIR IT UP 7.15

Find several examples of possible bias in books, magazines, television or radio programs, or newspaper articles and bring them to class for discussion. (Don't use editorials—that's too easy.) Look closely at your textbooks and note examples that seem to support a particular viewpoint. Many television "news magazines" are considered to have a conservative or liberal bias.

STIR IT UP 7.16

It is time to write. Pick an issue of your choice and create two viewpoints about it. For example, you might try writing two brief paragraphs about the use of marijuana, one from the viewpoint of a user and one from the viewpoint of a police officer, parent, doctor, or politician. See how subtly you can express each bias.

STIR IT UP 7.17

Remember the O.J. Simpson trial? It provides an excellent example for the following assignment. Dig back into the published records of the trial for this exercise, or find some other case in which expert testimony was contradicted by equally expert testimony. Check the editorial pages of publications (for example, local newspapers or the debate page in *USA Today*) or programs such as "Nightline" and "Newshour with Jim Lehrer." Find examples of reporting that are biased toward each side. Identify the basic disagreements and the reasons given for each side's support. Which side do you agree with? Why? Is there a third side?

The Differences Between Men and Women

Phyllis Schlafly

The first requirement for the acquisition of power by the Positive Woman is to understand the differences between men and women. Your outlook on life, your faith, your behavior, your potential for fulfillment, all are determined by the parameters of your original premise. The Positive Woman starts with the assumption that the world is her oyster. She rejoices in the creative capability within her body and the power potential of her mind and spirit. She understands that men and women are different, and that those very differences provide the key to her success as a person and fulfillment as a woman.

The women's liberationist, on the other hand, is imprisoned by her own negative view of herself and of her place in the world around her. This view of women was most succinctly expressed in an advertisement designed by the principal women's liberationist organization, the National Organization for Women (NOW), and run in many magazines and newspapers and as spot announcements on many television stations. The advertisement showed a darling curlyheaded girl with the caption: "This healthy, normal baby has a handicap. She was born female."

This is the self-articulated dog-in-the-manger, chip-on-the-shoulder, fundamental dogma of the women's liberation movement. Someone—it is not clear who, perhaps God, perhaps the "Establishment," perhaps a conspiracy of male chauvinist pigs—dealt

women a foul blow by making them female. It becomes necessary, therefore, for women to agitate and demonstrate and hurl demands on society in order to wrest from an oppressive male-dominated social structure the status that has been wrongfully denied to women through the centuries.

By its very nature, therefore, the women's liberation movement precipitates a series of conflict situations—in the legislatures, in the courts, in the schools, in industry—with man targeted as the enemy. Confrontation replaces cooperation as the watchword of all relationships. Women and men become adversaries instead of partners.

The second dogma of the women's liberationists is that, of all the injustices perpetuated upon women through the centuries, the most oppressive is the cruel fact that women have babies and men do not. Within the confines of the women's liberationist ideology, therefore, the abolition of this overriding inequality of women becomes the primary goal. This goal must be achieved at any and all costs—to the woman herself, to the baby, to the family, and to society. Women must be made equal to men in their ability *not* to become pregnant and *not* to be expected to care for babies they may bring into the world.

This is why women's liberationists are compulsively involved in the drive to make abortion and child-care centers for all women, regardless of religion or income, both socially acceptable and government-financed. Former Congresswoman Bella Abzug has defined the goal: "to enforce the constitutional right of females to terminate pregnancies that they do not wish to continue."

If man is targeted as the enemy, and the ultimate goal of women's liberation is independence from men and the avoidance of pregnancy and its consequences, then lesbianism is logically the highest form in the ritual of women's liberation. Many, such as Kate Millett, come to this conclusion, although many others do not.

The Positive Woman will never travel that dead-end road. It is self-evident to the Positive Woman that the female body with its baby-producing organs was not designed by a conspiracy of men but by the Divine Architect of the human race. Those who think it is unfair that women have babies, whereas men cannot, will have to take up their complaint with God because no other power is capable of changing that fundamental fact. . . .

The third basic dogma of the women's liberation movement is that there is no difference between male and female except the sex organs, and that all those physical, cognitive, and emotional differences you *think* are there, are merely the result of centuries of restraints imposed by a male-dominated society and sex-stereotyped schooling. The role imposed on women is, by definition, inferior, according to the women's liberationists.

The Positive Woman knows that, while there are some physical competitions in which women are better (and can command more money) than men, including those that put a premium on grace and beauty, such as figure skating, the superior physical strength of males over females in competitions of strength, speed, and short-term endurance is beyond rational dispute. . . .

Does the physical advantage of men doom women to a life of servility and subservience? The Positive Woman knows that she has a complementary advantage which is at least as great—and, in the hands of a skillful woman, far greater. The Divine Architect who gave men a superior strength to lift weights also gave women a different kind of superior strength.

The women's liberationists and their dupes who try to tell each other that the sexual drive of men and women is really the same, and that it is only societal restraints that inhibit women from an equal desire, an equal enjoyment, and an equal freedom from the consequences, are doomed to frustration forever. It just isn't so, and pretending cannot make it so. The differences are not a woman's weakness but her strength. . . .

The new generation can brag all it wants about the new liberation of the new morality, but it is still the woman who is hurt the most. The new morality isn't just a "fad"—it is a cheat and a thief. It robs the woman of her virtue, her youth, her beauty, and her love—for nothing, just nothing. It has produced a generation of young women

searching for their identity, bored with sexual freedom, and despondent from the loneliness of living a life without commitment. They have abandoned the old commandments, but they can't find any new rules that work.

The Positive Woman recognizes the fact that, when it comes to sex, women are simply not the equal of men. The sexual drive of men is much stronger than that of women. That is how the human race was designed in order that it might perpetuate itself. The other side of the coin is that it is easier for women to control their sexual appetites. A Positive Woman cannot defeat a man in a wrestling or boxing match, but she can motivate him, inspire him, encourage him, teach him, restrain him, reward him, and have power over him that he can never achieve over her with all his muscle. How or whether a Positive Woman uses her power is determined solely by the way she alone defines her goals and develops her skills.

The differences between men and women are also emotional and psychological. Without woman's innate maternal instinct, the human race would have died out centuries ago. There is nothing so helpless in all earthly life as the newborn infant. It will die within hours if not cared for. Even in the most primitive, uneducated societies, women have always cared for their newborn babies. They didn't need any schooling to teach them how. They didn't need any welfare workers to tell them it is their social obligation. Even in societies to whom such concepts as "ought," "social responsibility," and "compassion for the helpless" were unknown, mothers cared for their new babies.

Why? Because caring for a baby serves the natural maternal need of a woman. Although not nearly so total as the baby's need, the woman's need is nonetheless real.

The overriding psychological need of a woman is to love something alive. A baby fulfills this need in the lives of most women. If a baby is not available to fill that need, women search for a baby-substitute. This is the reason why women have traditionally gone into teaching and nursing careers. They are doing what comes naturally to the female psyche. The schoolchild or the patient of any age provides an outlet for a woman to express her natural maternal need. . . .

Finally, women are different from men in dealing with the fundamentals of life itself. Men are philosophers, women are practical, and 'twas ever thus. Men may philosophize about how life began and where we are heading; women are concerned about feeding the kids today. No woman would ever, as Karl Marx did, spend years reading political philosophy in the British Museum while her child starved to death. Women don't take naturally to a search for the intangible and the abstract. The Positive Woman knows who she is and where she is going, and she will reach her goal because the longest journey starts with a very practical first step.

READ AND RESPOND

1. What are some of the issues raised in this article?
2. From what point of view is the writer reasoning? How effective, how persuasive is her argument? Does it lead you to any thinking about your life, your beliefs, or your attitude toward women's issues?
3. Are the issues raised *really* important to society? Why? What other social issues do they relate to? Are the issues important to you? Why?
4. What bias do you find in this article, and how is it expressed?

Sexing Chickens

Richard DeWitt

Not surprisingly, it is important, within the poultry business, to distinguish between male and female chickens. As such, the poultry business employs a fair number of people whose primary job is the sexing of chickens. Chicken sexers are able to discriminate the sex of a chicken with apparent ease, yet when queried as to how they tell a boy from girl chicken, they are typically unable to specify any particular procedure. Learning this talent proceeds by hanging around an experienced chicken sexer until the novice begins to make the same judgments as the experienced sexer. Eventually the trainees are able to look at a chicken and reliably distinguish whether it is male or female, but apparently without the conscious use of any particular procedure. In short, they can do it, but they cannot say exactly how.

READ AND RESPOND

1. This paragraph is a small portion of a longer essay. What point is the author trying to get across? How important is it for us to know this information?
2. Assume that the paragraph following this one begins: "As is the case with the skill of chicken sexing . . ." How would you finish this sentence?
3. Do you believe this paragraph, or is the author playing a trick on you? Do you think that there really are chicken sexers? And if there are, is this really how you become one? What makes you think that in this high-tech age there are people standing around sexing chickens? What features of this paragraph make you believe or disbelieve? How can you validate the author's claims?

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Recognizing Organization

RECOGNIZING ORGANIZATION:
Identifying the organizational
pattern of a thought, statement,
passage, or plan

Sometimes we begin to read something or listen to someone speaking and we lose the train of thought. The book or talk no longer makes sense, and we get so frustrated that sometimes we just quit listening or reading. This happens because we can't tell how the author or speaker is developing the ideas or we can't identify the overall pattern of organization of what is being said. Recognizing the organization of what we read and hear assists us in figuring out what is relevant, important, and timely.

The way authors and speakers arrange their material to best accomplish their purpose and to express their ideas clearly is called the pattern of organization. You

need to be aware of this organization because it helps you to follow a speaker's or author's train of thought. You can think along with him or her, and you are less likely to lose sight of the main point, get frustrated, waste time, be tricked, or quit reading or listening.

Types of Prose Writing and Speaking

Nonfiction writing and most lecturing can generally be divided into four broad types.

1. *Narration*. The most easily recognized kind of writing and lecturing you'll encounter in college is called *narration*. The writer or speaker narrates events, either real or imagined, in chronological order and in much the same way a storyteller might. Typically, the writer or speaker starts at the beginning of some event and tells what happens until the event is concluded.
2. *Description*. The purpose of descriptive writing and speaking is to *describe* a specific person, thing, or place. The writer or speaker attempts to paint a mental picture using sensory words, that is, words that appeal to the reader's or listener's senses. Descriptive writing and speaking abound in concrete details of shape, color, sight, sound, smell, and taste.
3. *Persuasion*. The purpose of persuasive writing and speaking is to *persuade* you of something, to change your mind. The writer or speaker attempts to make you believe what he or she is saying and act on it. We see persuasive writing in editorials and advertisements, and we are barraged with it at election time when the candidates present their views. Persuasive speaking and writing relies heavily on both appeals to reason and appeals to the emotions. A related type of organization is *argumentation*, which refers to writing that sets up logically valid arguments in support of a specific viewpoint.
4. *Exposition*. Expository writing and speaking is the most common type of writing and speaking that you will encounter in college. Exposition is an attempt to lay out information, to explain something, to *expose* something as clearly as possible. It is factual writing and speaking. Expository organization may contain elements of narration, description, and persuasion, but its overwhelming objective is to present information.

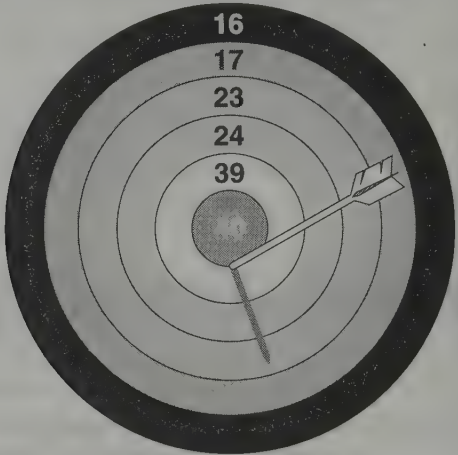
A variety of organizational patterns is possible within each of these four major types of writing and speaking. It is important to be able to recognize the patterns.

Common Overall Patterns of Organization and Their Clue Words

Most of the material college students are required to read and most of the lectures they will listen to are *expository*, that is, intended to inform or to explain. Several different patterns of organization can be used in expository writing. In well-thought-out lectures or reading, the organization is recognizable. The pattern of organization in most textbooks and lectures is likely to be either cause and effect (showing how something occurs because of other factors); comparison and contrast (pointing out likenesses and differences among ideas and events); time order (putting facts and events into a chronological sequence); statement and classification (statement of a fact or problem followed by discussion or solution); or simple listing (enumeration, in order, of facts, events, and ideas). Other patterns too are used. To improve your comprehension of the works you read and the lectures you hear, become aware of the twelve common organizational patterns described in the following chart. Also, notice the clue words that help you identify an organizational pattern.

Thinkers

How many arrows are needed to score exactly 100 points on this target?



Need a Hint?

Begin by dividing 100 (by 3, by 4, by 5, and so on) to see if your answers give you any clues.

Patterns of Organization and Their Clue Words

Pattern of Organization

Clue Words

1. *Time order*: discussion of events or ideas in relation to passing time
after, afterward, at last, at that time, before, during, immediately, now, presently, shortly, since, thereupon, until, while
2. *Simple listing / Process*: emphasis on the order in which something occurs
next, then, first, second, third, last
3. *Definition*: emphasis on the meaning of a word, phrase, or idea
means, can be defined as, the same as, like, is
4. *Statement and clarification*: statement of fact with discussion intended to make that statement clear
words, obviously, of course, too
5. *Classification*: analysis of where events, ideas, or facts fit in with other events, ideas, and facts
category, field, rank, group, various elements, characteristics, some feature, types, parts
6. *Summary*: condenses statement of the principal points in a larger statement or idea
in brief, in conclusion, in short, on the whole, to sum up, to summarize

7. *Comparison*: discussion of similarities in two or more ideas, events, or things
also, likewise, in like manner, similarly, similar to, compared with
8. *Contrast*: discussion of the differences in two or more ideas, events, or things
although, however, but, conversely, nevertheless, yet, on the contrary, on one hand . . . on the other hand, at the same time
9. *Generalization and example*: statement with examples designed to illustrate or clarify the statement
for example, e.g., for instance, that is, thus, to illustrate, as demonstrated
10. *Cause and effect*: a reason or condition and the subsequent effect or conclusion
accordingly, affect, as a result, and, because, consequently, hence, in short, may be due to, reasons, results, then, therefore, thus
11. *Addition*: emphasis on providing more information
again, also, and, besides, equally important, finally, further, furthermore, in addition, last, likewise, moreover
12. *Location / Spatial order*: emphasis on whereabouts of a thing or things
above, adjacent to, below, beyond, then, close by, elsewhere, inside, nearby, next to, opposite, within, without

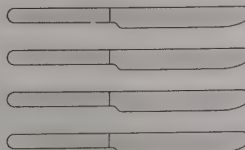
Mixed Patterns

Although writers and speakers generally follow one overall organization when they write and speak, they occasionally mix patterns in order to accomplish their objectives more efficiently. Mixing *comparison* and *contrast* is very common, as is mixing *definition* and *classification*. Don't be alarmed if you notice an author or a speaker moving from one pattern to a different one, or combining two patterns. This just means that you have mastered the technique of recognizing organization. It doesn't matter which pattern of organization an author or speaker employs as long as you recognize it.

Thinkers

The One-Bottle Problem

Construct a stable platform on top of a single bottle, using all four knives. **Remember:** Knives may not touch the ground or the table, and the platforms must be strong enough to hold a glass of water.



Need a Hint?

You'll need good balance for this.

STIR IT UP 7.18

Write a brief statement (three or four paragraphs) setting forth your feelings about illegal drug use, but write it according to a preselected pattern of organization. Be ready to discuss the ease or difficulty of doing this exercise.

STIR IT UP 7.19

On the lines provided, explain why it is important to be able to answer the following three questions as you do your reading assignments.

- a. Do I understand this material?
- b. Could I restate this material?
- c. Where does all this writing lead?

The Testimony of a Detroit Sniper

Ray Rogers
New York Post, July 29, 1967

A teenage Negro who identified himself as one of the elusive Detroit snipers says "the war" will not be over until "they kill all of us."

But, he insisted yesterday, his activities were not organized.

"When the thing broke out me and my main man were out there helping. We threw some cocktails. But after a while we got tired of that so we decided to go home and get our pieces," he explained.

"Get One or Two"

"We had them — cops so scared that first night they were shooting at one another. I know I got one or two of them, but I don't think I killed them. I wish I had, the dirty —."

The young man explained that he went and got his "piece" after he and his buddy had looted a liquor store.

"We drank a little. And after a while—boom, just like that we decided to do some shootin'."

Did he realize he could be killed?

"I'm not crazy—I'm not crazy to be killed. I'm just gettin' even for what they did to us. Really. That's where it's at."

"Man, they killed Malcolm X just like that. So I'm gonna take a few of them with me. They may get me later on, but somebody else will take my place—just like that."

He explained that he avoided the area patrolled by the airborne troops because of the intensity with which they returned fire.

"They got a lot of soul brothers in their outfit too and I'm not trying to waste my own kind. I am after them honkies . . ." he said.

Mother Died

His mother had died years ago, leaving him and his sister in a dilapidated apartment, he said.

"Man, that place was so bad that I hated to come home at night. My sister became a hustler for a guy I grew up with." He said he had heard that she had been shot Wednesday night while looting a store.

"That makes me mad. Why they have to shoot somebody for takin' something out of a store during a riot? These white mothers are something else," he said angrily as he rubbed his long, powerful fingers together.

He said he wished he had a better weapon than the U.S. M1 automatic carbine because it lacked range and fire power. Thus he could not fire more than one or two rounds at most before National Guardsmen laid down a heavy barrage.

"But I know I got two of them. I saw them mothers fall.

"One was a honky-tonk cop with a big belly and he couldn't run too fast. And when I hit him he hollered and hit the pavement.

"And them stupid mothers fired all over the place except the place where I was—I was laying among some bricks in a burnt-out store. It was beautiful, baby, so beautiful I almost cried with joy."

He said he never carried the carbine with him and he hid it in a different place after each time he used it.

He laughed and said:

"Twice they had their hands on me and searched me but they let me go. That's why I say that the war ain't over until they put all of us in jail or kill us. . . . I mean all of us soul brothers. But they can't do that because there's too many of us."

Suddenly he began talking about his early life.

"I went to school just like you did. I believed in all that oakie-doak and then I woke up one day and said later for that stuff because that stuff would just mess up my mind, just mess up my mind. I hustled and did a little bit of everything to stay alive.

"I got a couple of kids by some sister on the other side of town but I never see them. What can I say to them?"

He said that he and his buddy paid his 10-year-old cousin to watch for National Guard patrols while they were staked out on roofs. They communicated with him by a toy walkie-talkie.

"It was funny for a while because all they could do was lay there and holler at one another. Man, it was beautiful. We controlled the scene.

"We were just like guerrillas—real ones."

READ AND RESPOND

1. What criteria can you use to evaluate the sniper's reasoning in this article? Is there any reasoning present? If so, what is it? Are there any fallacies in the reasoning?
2. Are there other causes, not identified, for the sniper's behavior?
3. What would you predict for the future of this sniper? Why? What is your prediction based on?

Who Benefits?

James R. Hearl

In 1986, when Congress passed the Tax Reform Act, it also slipped in another piece of legislation that could mean a great deal more to both employers and employees than tax reform ever will. As a matter of fact, any tax simplification achieved by tax reform could well be wiped out by the headaches created by Section 89.

The story behind Section 89 is one of good intentions. The Congress wanted to make sure that the bosses won't be treated substantially better than the workers when employee benefits are passed out. At first glance, this may seem like a great idea, especially if you're a worker. But take a closer look at Section 89 in action.

The provision that probably affects you as a college student most directly compels companies to give essentially the same benefit package to all part-time employees working over 17.5 hours per week that it gives to its full-time employees. Put yourself into the position of the owner of the Sleeping Beauty Motel chain. You have 100 full-time employees, all in managerial positions, each earning \$30,000 per year in addition to a benefit package costing \$2,000. You also have 1,000 part-time employees working 20 hours per week and earning minimum wage, or about \$3,500 per year. What are your choices under the new law? You can extend full-time benefits to all of your part-time employees, essentially increasing their compensation by nearly 60 percent and your labor costs by 20 percent. Or you can cut the hours of your part-time employees to the maximum allowable by law before you must offer benefits, reducing their incomes by 12.5 percent and requiring you to hire and train an additional 140 employees. Or you can stop hiring part-time employees altogether. If you pursue this last option, you will have to let 500 employees go and your labor costs will still increase by 10 percent. Finally, you can quit giving employee benefits entirely and opt instead to give your full-time employees a \$2,000 raise.

Although this example is a bit extreme, it shows that there may be tremendous costs involved in extending benefit packages to all part-time employees, costs that profit-maximizing owners will not want to (and may not be able to) absorb. So, rather than ensuring equal benefits for everyone, the law will likely reduce benefits for many and make them harder to get for many more. An employee who is looking for a good benefit package to help pay for braces for his or her children may find it hard to get one because many employers will merely pare down everyone's benefits to comply with the law. This may be a small matter, however, compared with the problems faced by individuals who want to work something like 30 hours per week. They will either have to work two jobs (at less than 17.5 hours each) or work full-time, if they are to work at all.

READ AND RESPOND

1. What are the implications of Section 89 of the Tax Reform Act for you personally? Are you working part-time? Are you receiving any benefits? Why not? If you are working part-time and not receiving any benefits, what does that suggest about the information in this article?
2. What conflicts are present in the values that come into play when employers comply with Section 89?
3. What would happen if every employer decided to stop hiring part-time workers so that there were only full-time workers? What would be the implications for the economy?

Recognizing Underlying Assumptions

What questions am I going to have answered in this section on recognizing underlying assumptions?

1. In what ways might our values shape our position in an argument or shape our reaction to world events?
2. Why do we frequently examine our assumptions only when a problem develops?
3. What are the two types of underlying assumptions, and how are they different?

RECOGNIZING UNDERLYING ASSUMPTIONS:

Recognizing the suppositions that are taken for granted and that are the foundation of a proposition, notion, or idea

I just went to the store and purchased two candy bars for a total of \$1.00. How much did each candy bar cost?

"Fifty cents," you quickly answer.

"Wrong," I say. "One candy bar cost 40 cents and the other, bigger candy bar cost 60 cents."

"No fair," you reply. "You tricked me. Most candy bars are the same price. I assumed that both candy bars you were talking about were the same size. You should have told me they were different sizes."

"You made an incorrect assumption."

What's the point of this story? In every situation where a conclusion is called for, even the most simple, there are underlying assumptions. Not to consider these assumptions is to increase the likelihood of responding incorrectly to the situation.

Assumptions are Part of Our Lives

Everything we think, reason, say, or do is based on assumptions, things we believe are true. Assumptions are those unstated beliefs that we take for granted and upon which we base our actions or rest our arguments.

For example, perhaps at the age of 18 you take your first college course. In class you find that nearly everyone looks to be about the same age. After a few weeks, you ask the friendly, attractive student sitting next to you to go out with you. The student says, "Thank you, but I'm married." Oops! You acted on at least one false assumption. You assumed that because the other students in the class appeared to be your age, they were also unmarried. What you didn't do was identify your assumptions and check their validity before acting on them. It is easy for you to identify your assumption now because it led to some embarrassment for you. This is frequently the case with assumptions. We identify them only when it is too late and they have caused us problems.

Assumptions differ from person to person, but they all tend to become deeply ingrained over time in our thinking. We seldom examine them or check them for appropriateness or consistency until we are confronted by conflicting ideas. Until then, assumptions are simply *there* and not thought about. In any discussion, debate, or presentation of an argument, assumptions are usually left unstated, but they are still present. They determine not just what we say but what we really mean.

Why Seek Hidden Assumptions?

The ability to identify hidden assumptions is an important critical thinking skill for life as well as college. Knowing that everything we learn in college is based on a variety of assumptions, and realizing that all people have assumptions on which they base their thinking and decision making, will help us be more aware of our thinking, reasoning, and actions. As we identify hidden assumptions in ourselves and others, as we assess and correct our assumptions, we can use our growing knowledge to understand what writers and speakers *really* mean. This will help keep us from faulty reasoning and poor decisions. Other people's assumptions are frequently wrong—or at least different from our own—and any argument, proposition, or idea based

on those faulty assumptions will also be faulty. Reasoning is only as sound as the assumptions it is based on. That is why it is important to examine, question, and understand underlying assumptions. We need to be certain we are not accepting good arguments based on nonexistent or misunderstood “facts.” If we do not understand what the underlying assumptions are for a particular idea, we will have very little chance at recognizing the truth or merit of the idea.

Finding underlying assumptions is a “collecting” process. You collect hints from the things people say and then make guesses about what they believe but don’t say. These hidden assumptions then can be examined in order to interpret or explain what is really meant and why it is being said.

Think About This!

Ludicrous Laws

Laws reflect people’s thinking at certain times in history. A law originates because people in a certain locale at a certain point in time feel the need to legislate a particular type of behavior. As time passes, some laws may no longer be needed, and they are changed to reflect the current times or they are dropped. However, some laws are never changed because of legislative inertia. Contemplating these outdated laws provides us with an opportunity to examine the thinking process of people in the past. Consider the following examples of “ludicrous laws” that are still on the books, and attempt to figure out why these laws were originally legislated. Record your explanations on the lines.

- ▶ In Brooklyn, New York, it is against the law to let an animal go to sleep in your bathtub.

- ▶ In Spades, Indiana, it is illegal to open a can of food by firing a revolver at it.

- ▶ In Connecticut, it is against the law to walk your pet bear along the highway.

- ▶ In California, you need a hunting license to capture mice.

- ▶ In Garfield County, Montana, people are forbidden to draw cartoons or funny faces on their window shades.

Which of our current laws do you think would be ludicrous or incomprehensible to people living in 1800? List a few.

Thinkers

On a Corner . . .

The first modern one appeared on a corner on Euclid Avenue in Cleveland, Ohio, in 1914. What was it?

Need a Hint?

What can be found on street corners, and what “modern” thing came into wide use about 1914?

Two Kinds of Assumptions

There are two main categories of assumptions: *value assumptions* and *reality assumptions*.

Value assumptions are beliefs (ideals really) that we accept and hold about the way things ought to be. These assumptions are based on the values communicated to us by such people as family members, religious leaders, and people we associate with. The values we absorb and accept as we mature form the basis of our opinions. Some values are so universally accepted that we assume that everyone holds them. For example, murder, rape, and other forms of violence against individuals is wrong; helping the weak, sick, and poor is right. However, not all values that we may hold are held by other people, or are held as strongly as we hold them. We may believe that gambling, drugs, and prostitution do no harm and should be legalized, but we find that many people don’t share our values and disagree with us. In many cases, arguments and conflicts occur because the opposing sides have different values. It is common to hear the words “You’re assuming that I . . .” when two people disagree.

Reality assumptions are beliefs (perceptions really) that we hold about the way things are. They are assumptions that we make and hold about what happened or what exists or how something works. In any criminal trial, the two sides, prosecution and defense, base their trial arguments on reality assumptions—what each thinks really happened during the crime. The evidence that is presented, the witnesses that are called, the arguments that are raised—all are determined by each side’s reality assumptions. Whether the two sides and the jury believe a person guilty or not guilty has to do with their assumptions concerning reality—what they believe really happened. When two cars collide at a busy intersection, the two drivers usually have different reality assumptions. In fact, their perceptions of what happened may differ dramatically. It is not surprising that police officers and insurance agents frequently must rely on detached, unemotional observers to determine what really occurred.

STIR IT UP 7.20

What are the assumptions behind the statements below? Several assumptions can usually be seen at work in each case. Where do you think the assumptions came from? Under what conditions might they have been formed? Are they value assumptions or reality assumptions? Who is making these statements?

1. The person I want to hire for the position of senior engineer should be very experienced. He should have exceptional references.

2. I don't care if you are going to the beach, you are not wearing that bathing suit.

3. Growing, selling, and smoking marijuana should be legalized.

4. Radios are as necessary in cars as airbags.

5. The sheer number of professional and amateur boxing matches proves that Americans prefer violent sports.

6. At their ages, they should live together for a while before they get married.

7. You're going to love this shirt I bought you.

8. If you care about the poor, you'll support Proposition 22.

9. That bottled mineral water is of superior quality; it comes from Europe.

10. I was really surprised—and a bit horrified—when I learned that she went out with him.

STIR IT UP 7.21

There are several assumptions underlying each of the following accounts. What are they?

1. The lights were low, the room was crowded, the conversation was loud, and the music was even louder. He walked up to me, slowly looked me over from head to toe—spending more time on some parts of my anatomy than others—and asked, "What's a nice girl like you doing in a place like this?"
2. I think it is a real shame that Native Americans are not forced to leave reservation lands when they are children and go to school in communities with public schools. Unless this occurs, Native Americans will never make any major contribution to society.
3. The man walking back and forth in front of the Planned Parenthood clinic was wearing a homemade sandwich board that said, "The wages of sin is death."
4. The main reason there is so much juvenile crime is that there are no mothers at home anymore during those early formative years. They have put the children in 'holding pens' in daycare centers.

STIR IT UP 7.22

When is the thinking skill of recognizing underlying assumptions especially important? See how many additional occasions you can add to the following list.

1. When reading anything in newspapers or magazines.
2. When analyzing contractual agreements.
3. When negotiating a change in job responsibilities.
4. When reading my world history textbook.
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

STIR IT UP 7.23

Identify at least one possible underlying assumption for each of the situations you listed in Stir It Up 7.22.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Thinkers

By moving only the minus sign (–) in the number below, create nine-fifty.

-101010

Need a Hint?

This isn't a math problem; it is an "appearance" problem. Take time to look at it closely.

STIR IT UP 7.24

What assumptions do you have about your college education? What assumptions do you have about your professors, about your textbooks, about the purpose of your assignments, about the difficulty of the work, about the amount of studying required? List some of your assumptions below. What assumptions do you or did you have about dormitory life, dating at college, the ease of making friends? Next to each assumption, indicate how you can check its validity.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

STIR IT UP 7.25

What do you assume when you see a newspaper advertisement that boldly proclaims, "All new cars being sold at below dealer cost"? Identify some of your assumptions below.

STANDARDS FOR THINKING AND REASONING

Identify the three most important critical thinking standards to be applied to the skill of **recognizing underlying assumptions**. Put a check (✓) next to your three choices. Be ready to explain your thinking. Why these three?

- | | | |
|----------------------------------|--------------------------------------|-------------------------------------|
| ☐ Clear | ☐ Specific | ☐ Relevant |
| ☐ Logical | ☐ Significant | ☐ Fair |
| ☐ Precise | ☐ Accurate | ☐ Consistent |
| ☐ Deep | ☐ Complete | ☐ Adequate |

Any Questions?

How many different ways can you write 1999 in Roman numerals?

Choosing Healthier Foods?

James R. Kearl

In late 1991, the U.S. government announced new regulations, to be implemented gradually, governing the labeling of food. Some 80,000 types of food and almost 300,000 food labels will come under a common set of regulations. Terms such as “fresh,” “low calorie,” “fat free,” “low in cholesterol,” “light,” “less,” “reduced,” and “more” will have specific, consistent meanings on all labels. Nutrition labeling will be mandatory on processed foods but voluntary, at least initially, for raw fruits, vegetables, meat, poultry, and seafood. Health claims will be allowed only if they can be supported by scientific evidence. The government will also regulate serving sizes. Implementation costs (new labels, standardized packaging, and so on) for manufacturers are estimated to be \$1.7 billion over 20 years.

One purpose of the regulations is to better inform consumers of the nutrients in foods they purchase. Since words and labels will be consistent across products, the regulations should reduce the cost to consumers of gathering useful information. Better informed consumers, it is hoped, will make more healthful food consumption decisions. Standardized serving sizes will allow consumers to see price changes more clearly. (In the past, price changes could be hidden partially by changes in serving sizes.)

A second purpose of the regulations is to provide incentives for firms to get a competitive edge by providing more healthful food products. If producers assume that consumers make choices based on the healthfulness of the product, then, consumer advocates argue, firms will have the appropriate incentives to produce more healthful products.

There is evidence that firms do respond to their belief that the public will be more critical. That is, incentives of this sort make a difference. In late 1991, a survey of 421 companies found that 70 percent were developing new reduced-fat and reduced-calorie products. Moreover, the number of products with health-related marketing claims increased to 10,301 in 1990, up from 9,192 in 1989 and 8,183 in 1988.

READ AND RESPOND

1. What are some of the underlying assumptions on the part of the government, businesses, and consumers that are behind the decisions and actions described in this article?
2. Is "health labeling" an important issue to society? Is this issue important to you? Why or why not?
3. Two purposes are given for the labeling regulations. Are there others, perhaps ones which may not be quite as publicly acceptable? What are they?

The Great Railway Competition

Jack Chen

On the plains, the Chinese worked in tandem with all the Indians Crocker could entice to work on the iron rails. They began to hear of the exploits of the Union Pacific's "Irish terriers" building from the east. One day, the Irish laid six miles of track, they were told. The Chinese of the Central Pacific topped this with seven. "No Chinaman is going to beat us," growled the Irish, and the next day, they laid seven and a half miles of track. They swore that they would outperform the competition no matter what it did.

Crocker taunted the Union Pacific that his men could lay ten miles of track a day. Durant, president of the rival line, laid a \$10,000 wager that it could not be done. Crocker took no chances. He waited until the day before the last sixteen miles of track had to be laid and brought up all needed supplies for instant use. Then he unleashed his crews. On April 28, 1869, while Union Pacific checkers and newspaper reporters looked on, a combined gang of Chinese and eight picked Irish rail handlers laid ten miles and 1,800 feet more of track in twelve hours. This record was never surpassed until the advent of mechanized track laying. Each Irishman that day walked a total distance of ten miles, and their combined muscle handled sixty tons of rail.

So keen was the competition that when the two lines approached each other, instead of changing direction to link up, their builders careered on and on for 100 miles, building lines that would never meet. Finally, the government prescribed that the linkage point should be Promontory [Point], Utah.

Competition was keen, but there seems to be no truth in the story that the Chinese and Irish in this phase of work were trying to blow each other up with explosives. It is a fact, however, that when the two lines were very near each other, the Union Pacific blasters did not give the Central Pacific men timely warning when setting off a charge, and several Chinese were hurt. Then a Central Pacific charge went off unannounced and several Irishmen found themselves buried in dirt. This forced the foremen to take up the matter and an amicable settlement was arranged. There was no further trouble.

On May 10, 1869, the two lines were officially joined at Promontory [Point], north of Ogden in Utah. A great crowd gathered. A band played. An Irish crew and a Chinese crew were chosen to lay the last two rails side by side. The last tie was made of polished California laurel with a silver plate in its center proclaiming it "The last tie laid on the completion of the Pacific Railroad, May 10, 1869." But when the time came it was nowhere to be found. As consternation mounted, four Chinese approached with it on their shoulders and they laid it beneath the rails. A photographer stepped up and someone shouted to him "Shoot!" The Chinese only knew one meaning for that word. They

fled. But order was restored and the famous ceremony began; Stanford drove a golden spike into the last tie with a silver hammer. The news flashed by telegraph to a waiting nation. But no Chinese appears in that famous picture of the toast celebrating the joining of the rails.

Crocker was one of the few who paid tribute to the Chinese that day: "I wish to call to your minds that the early completion of this railroad we have built has been in large measure due to the poor, despised class of laborers called the Chinese, to the fidelity and industry they have shown." No one even mentioned the name of Judah.

The building of the first transcontinental railway stands as a monument to the union of Yankee and Chinese-Irish drive and know-how. This was a formidable combination. They all complemented each other. Together they did in seven years what was expected to take at least fourteen.

In his book on the building of the railway, John Galloway, the noted transportation engineer, described this as "without doubt the greatest engineering feat of the nineteenth century," and that has never been disputed. David D. Colton, then vice-president of the Southern Pacific, was similarly generous in his praise of the Chinese contribution. He was asked, while giving evidence before the 1876 congressional committee, "Could you have constructed that road without Chinese labor?" He replied, "I do not think it could have been constructed so quickly, and with anything like the same amount of certainty as to what we were going to accomplish in the same length of time."

And, in answer to the question, "Do you think the Chinese have been a benefit to the State?" West Evans, a railway contractor, testified, "I do not see how we could do the work we have done, here, without them; at least I have done work that would not have been done if it had not been for the Chinamen, work that could not have been done without them."

It was heroic work. The Central Pacific crews had carried their railway 1,800 miles through the Sierra and Rocky mountains, over sagebrush desert and plain. The Union Pacific built only 689 miles, over much easier terrain. It had 500 miles in which to carry its part of the line to a height of 5,000 feet, with another fifty more miles in which to reach the high passes of the Black Hills. With newly recruited crews, the Central Pacific had to gain an altitude of 7,000 feet from the plain in just over 100 miles and make a climb of 2,000 feet in just 20 miles.

All this monumental work was done before the age of mechanization. It was pick and shovel, hammer and crowbar work, with baskets for earth carried slung from shoulder poles and put on one-horse carts.

For their heroic work, the Chinese workmen began with a wage of \$26 a month, providing their own food and shelter. This was gradually raised to \$30 to \$35 a month. Caucasians were paid the same amount of money, but their food and shelter were provided. Because it cost \$0.75 to \$1.00 a day to feed a white unskilled worker, each Chinese saved the Central Pacific, at a minimum, two-thirds the price of a white laborer (1865 rates). Chinese worked as masons, dynamiters, and blacksmiths and at other skilled jobs that paid white workers from \$3 to \$5 a day. So, at a minimum, the company saved about \$5 million by hiring Chinese workers.

Did this really "deprive white workers of jobs" as anti-Chinese agitators claimed? Certainly not. In the first place, experience had proved that white workers simply did not want the jobs the Chinese took on the railroad. In fact, the Chinese created jobs for white workers as straw bosses, foremen, railhandlers, teamsters, and supervisors.

The wages paid to the Chinese were, in fact, comparable to those paid unskilled or semiskilled labor in the East (where labor was relatively plentiful), and the Chinese were at first satisfied. Charles Nordhoff estimated that the frugal Chinese could save about \$13 a month out of those wages. The *Alta California* estimated their savings at \$20 a month and later, perhaps, as wages increased, they could lay aside even more. With a bit of luck, a year and a half to two years of work would enable them to return to China with \$400 to buy a bit of land and be well-to-do farmers.

But the Chinese began to learn the American way of life. On one occasion in June 1867, 2,000 tunnelers went on strike, asking for \$40 a month, an eight-hour day in the

tunnels, and an end to beating by foremen. "Eight hours a day good for white man, all same good for Chinese," said their spokesman in the pidgin English common in the construction camps. But solidarity with the other workers was lacking, and after a week the strike was called off when the Chinese heard that Crocker was recruiting strike-breakers from the eastern states.

When the task was done, most of the Chinese railwaymen were paid off. Some returned to China with their hard-earned savings, and the epic story of building the Iron Horse's pathway across the continent must have regaled many a family gathering there. Some returned with souvenirs of the great work, chips 'of one of the last ties, which had been dug up and split up among them. Some settled in the little towns that had grown up along the line of the railway. Others took the railway to seek adventure further east and south. Most made their way back to California and took what jobs they could find in that state's growing industries, trades, and other occupations. Many used their traditional and newly acquired skills on the other transcontinental lines and rail ways that were being swiftly built in the West and Midwest. This was the start of the diaspora of the Chinese immigrants in America.

The Union and Central Pacific tycoons had done well out of the building of the line. Congressional investigation committees later calculated that, of \$73 million poured into the Union Pacific coffers, no more than \$50 million could be justified as true costs. The Big Four and their associates in the Central Pacific had done even better. They had made at least \$63 million and owned most of the CP stock worth around \$100 million and 9 million acres of land grants to boot.

Ironically, the great railway soon had disastrous results for the Chinese themselves. It now cost only \$40 for an immigrant to cross the continent by rail and a flood of immigrants took advantage of the ease and cheapness of travel on the line the Chinese had helped to build. The labor shortage (and resulting high wages) in California turned into a glut. When the tangled affairs of the Northern Pacific line led to the stock market crash of Black Friday, September 19, 1873, and to financial panic, California experienced its first real economic depression. There was devastating unemployment, and the Chinese were made the scapegoats.

READ AND RESPOND

1. What was at the heart of the competition described in this article? How did the competition begin? Was it a "healthy" competition? Why or why not?
2. Summarize the life of a Chinese railroad worker of the 1860s.

Execution of a Witch at Sea

Account of Father Francis Fitzherbert's Voyage to Maryland

Four ships sailed together from England, which a fearful storm overtook, when carried beyond the Western Isles, and the ship in which the Father was carried, the violent waves so shattered, that, springing a leak by the continued violence of the sea, it almost filled its hold. But in carrying away and exhausting the water, the men, four at a time, not only of the ship's crew but of the passengers, every one in his turn, sweated at the great pump in ceaseless labor, day and night.

Wherefore, having changed their course, their intention was to make sail towards the island, which the English call Barbados; but it could be accomplished by no art, by

no labor; then the design was, having abandoned the ship and its freight, to commit themselves to the long boat. But the sea, swelling with adverse winds, and the huge mountainous waves, forbade. Many a form of death presenting itself to the minds of all, the habit of terror, now grown familiar, had almost excluded the fear of death. The tempest lasted two months in all, whence the opinion arose, that it was not raised by the violence of the sea or atmosphere, but was occasioned by the malevolence of witches. Forthwith they seize a little old woman suspected of sorcery; and after examining her with the strictest scrutiny, guilty or not guilty, they slay her, suspected of this very heinous sin. The corpse, and whatever belonged to her, they cast into the sea. But the winds did not thus remit their violence, or the raging sea its threatenings. To the troubles of the storm, sickness was added, which having spread to almost every person, carried off not a few. Nevertheless, the Father remained untouched by all the contagion, and unharmed, except that in working and exercising at the pump too laboriously, he contracted a slight fever of a few days' continuance. Having passed through multiplied dangers, at length, by the favor of God, the ship, contrary to the expectation of all, reached the port of Maryland.

The Testimonies of Two Witnesses

The Deposition of mr Henry Corbyn of London Merchant aged about 25 years, Sworne and Examined in the Province of Maryland before the Governour & Councell there (whose Names are hereunto Subscribed) the 23th day of June Anno Domini 1654. Saith

That at Sea upon his this Deponents Voyage hither in the Ship called the Charity of London m^r John Bosworth being Master and about a fortnight or three weeks before the Said Ships arrivall in this Province of Maryland, or before A Rumour amongst the Seamen was very frequent, that one Mary Lee then aboard the Said Ship was a witch, the Said Seamen Confidently affirming the Same upon her own deportment and discourse, and then more Earnestly then before Importuned the Said Master that a tryall might be had of her which he the Said Master, m^r Bosworth refused, but resolved (as he Expressed to put her ashore upon the Barmudoes) but Cross winds prevented and the Ship grew daily more Leaky almost to desparation and the Chiefe Seamen often declared their Resolution of Leaving her if an opportunity offered it Self which afore-said Reasons put the Master upon a Consultation with m^r Chipsham and this Deponent, and it was thought fitt, Considering our Said Condition to Satisfie the Seamen in a way of trying her according to the Usuell Custome in that kind whether She were a witch or Not and Endeavoured by way of delay to have the Commanders of other Ships aboard but Stormy weather prevented, In the Interime two of the Seamen apprehended her without order and Searched her and found Some Signall or Marke of a witch upon her, and then calling the Master m^r Chipsham and this Deponent with others to See it afterwards made her fast to the Capstall betwixt decks, And in the Morning the Signall was Shrunk into her body for the Most part, And an Examination was thereupon importuned by the Seamen which this Deponent was desired to take where-upon She confessed as by her Confession appeareth, And upon that the Seamen Importuned the Said Master to put her to Death which as it Seemed he was unwilling to doe, and went into his Cabbinn, but being more Vehemently pressed to it, he tould them they might doe what they would and went into his Cabbinn, and Sometime before they were about that Action he desired this depon^t to acquaint them that they Should doe no more then what they Should Justifie which they Said they would doe by laying all their hands in generall to the Execution of her, All which herein before Expressed or the Same in Effect this Depon^t averreth upon his oath to be true, And further Sayth not.

William Stone
Tho: Hatton
Job Chandler

Sworne before us the
day and year above written

Henry Corbyne

The Deposition of Francis Darby Gent Aged about 39 yeares Sworne and Examined in the Province of Maryland before the Governour and Councill there whose Names are hereunto Subscribed the 23 day of June Anno Domini 1654, Saith

That at Sea upon the Voyage hither about a fortnight or three weeks before the Arrivall of the Ship called the Charity of London in this Province of Maryland, whereof m^r John Bosworth was then Master and upon the Same day that one Mary Lee was put to Death aboard the Said Ship as a witch he the Said m^r Bosworth Seeing him this Deponent backward to Assist in the Examination of her asked this Depon^t why? and tould him that he was perplext about the busieness Seeing he did not know how he might doe it by the Law of England afterwards this deponent being present in the Round house heard the Said m^r Bosworth give Order that nothing Should be done concerning the Said Mary Lee without Speaking first with him, and after She was put to Death or Executed to the best of this Deponents remembrance he Said he knew nothing of it, And this Deponent Saith that the Said Bosworth was in the inner room of the Round-house, he this deponent being in the next room at the time they treated about the busieness And this Depon^t could not perceive any thing either by word or Deed whereby he gave order for her Execution or putting to Death and after this he Commanded they Should doe Nothing without his Order and alsoe after the Execution, expressed he knew not of it for that this Deponent hearing these words (She is dead) ran out and asked who was dead, and it was replied the witch then this Deponent Entred the next Room and Said they have hanged her and he the Said Bosworth thereupon as it were Speaking with trouble in a high Voyce replied he knew not of it All which herein before Expressed or the Same in Effect this Deponent averreth upon his oath to be true, And further Sayth not.

Sworne before us the day and

Francis Darby

Yare abovewritten

William Stone

Tho: Hatton

Job Chandler

READ AND RESPOND

1. These three accounts describe from different perspectives the killing of an old woman thought to be a witch. There seems to be some confusion in the accounts as to who was responsible for making the decision to have her executed. Reconstruct as best you can the circumstances that resulted in the execution. Who did what? How do you account for the different perspectives? Is one account more accurate than the others? How much do you have to rely on inference in order to reconstruct what you believe occurred?
2. What evidence is cited for the conclusion that the old woman was a witch? From your perspective, how much of this “evidence” can be explained away? Why couldn’t the people on the ship explain the evidence away? Weren’t there alternatives to execution available?
3. Do we encounter similar reasoning and behavior today about anything?

Asking Critical Questions

After you read the article that follows, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the article in proper context and to completely understand what is being said or reported? *On the lines following the article, write three questions that, if answered, will help you understand what is really being said.*

Human Intelligence: Are There Genes for IQ?

Joseph Levine and Kenneth Miller

Every person is an individual with unique capacities, abilities, strengths, and weaknesses. Just as individuals differ in physical characteristics, they differ in mental characteristics too. In 1903 Alfred Binet, a French social scientist, introduced a test to measure intelligence—the *IQ test*. The premise of the test was simple. Just as all people have a physical age, Binet reasoned, they have a mental age. He also assumed that an *intelligence quotient (IQ)* could be computed by dividing the mental age by the physical age and multiplying by 100. A child of 10 with a mental age of 9 would have an IQ of 90, for example, whereas a child of the same age with a mental age of 11 would score 110 on the test.

Intelligence quotient scores differ widely among the human population. However, the claim that IQ tests measure intelligence has been challenged by many investigators, some of whom have charged that the tests are flawed by hidden racial and ethnic bias. We will leave those questions unanswered and instead will ask a question that is a bit more biological. Are individual differences in IQ scores the result of genetic differences between individuals or the result of differences in the individual environments that children experience in their formative years? In short, are there genes for IQ?

The answer to this question is emotionally charged for a number of reasons. One of them is finding that average IQ scores of American blacks are about 15 points lower than average IQ scores of American whites. Some scholars, including Arthur Jensen and William Shockley (the latter is one of the inventors of the transistor), have cited this as proof that differences in average academic performance between white and black children are biological and cannot be eliminated by improved schooling. There is substantial evidence that the ability to score well on an IQ test may indeed be inherited to some degree. Identical twins, whether they are reared together or apart, are more likely to have similar IQ scores than nonidentical siblings reared together. Unrelated children who are adopted into the same home, by contrast, do not show any strong similarity of scores.

However, the situation is not as simple as these statistics may make it appear. Studies of children adopted from orphanages have shown that adoption itself may raise the adopted child's IQ score by as much as 10 points, and there is a very high correlation of IQ level with social and economic status. Individual IQ is now known to be variable, which is to say that it can be changed by study and a positive learning environment, and it may be dramatically affected by self-image (what a child thinks of himself or herself). Therefore, many other social scientists have cautioned that the prevalence of social and economic inequality is not entirely the *result* of differences in IQ scores between different racial groups but rather acts as one of the *causes* of such differences. At this point, there is little doubt that intelligence is shaped by both genetic and environmental factors, but there is little scientific support for the notion that biological differences will undermine the positive effects of improved schooling for any children.

MY CRITICAL QUESTIONS

1.

?

2.

?

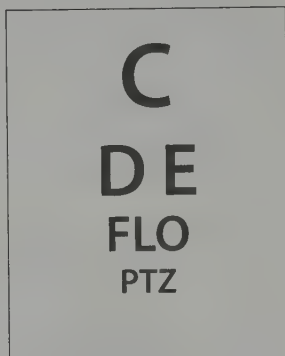
3.

?

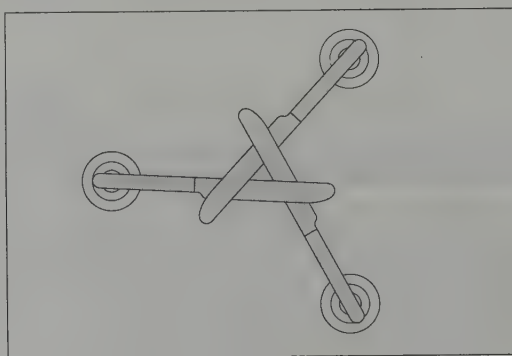
SOLUTIONS TO ITEMS IN THIS CHAPTER

Thinkers (p. 132)

On a doctor's eye chart:

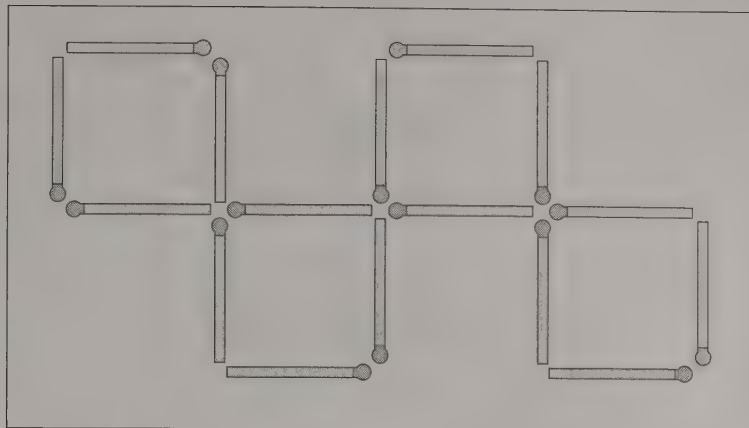
**Thinkers (p. 134)**

The easiest solution requires only three knives, not four.

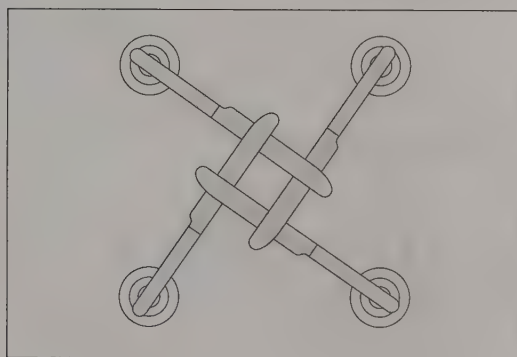
**Any Questions? (p. 135)**

Of course Sam the Thinker could steal the extra dollar, but let's assume he doesn't. Here is one possible way to get the extra dollar: He takes the two-dollar bill to a pawnshop, where he pawns it for \$1.50. He then meets a stranger to whom he offers to sell the \$1.50 pawn ticket (that will get the stranger \$2 at the pawn shop) for \$1.50. The stranger thinks getting \$2 for \$1.50 is a good deal and gives him \$1.50. Sam the Thinker now has \$3. Who is out the extra dollar? The stranger. When he takes the pawn ticket to the pawn shop, *he has to pay \$1.50 to redeem the \$2*. Thus, he spends a total of \$3 to acquire \$2.

Thinkers (p. 144)

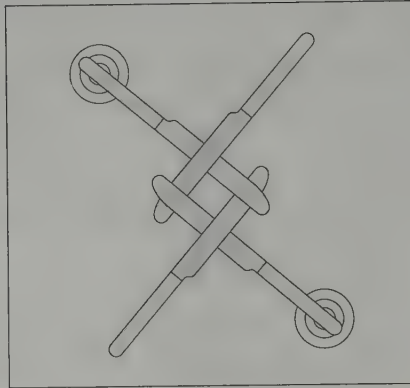


Thinkers (p. 146)



Thinkers (p. 157)

H O B O

Thinkers (p. 158)**Think About This! (p. 166)**

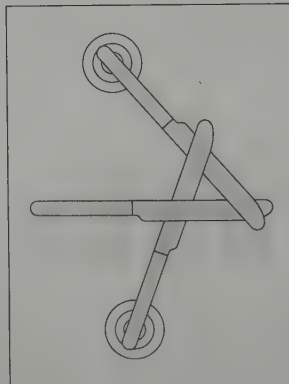
This menu was drawn up when Paris was under siege by the Prussian army during the Franco-Prussian War. Normal food supplies had been used up. How close to this reason were your ideas?

Thinkers (p. 167)

When you read the poem aloud, a listener should hear:

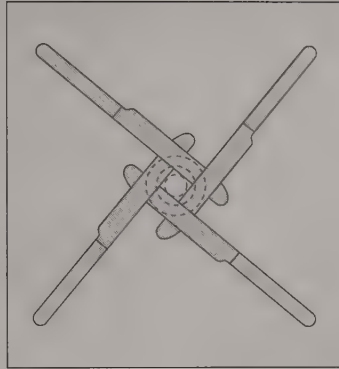
"Oh see, Billy, see 'er go,
Forty buses in a row."

"Oh no," said Billy, "them is trucks.
See what's in 'em, cows or ducks."

Thinkers (p. 168)

Thinkers (p. 174)

Six arrows: 17, 17, 17, 17, 16, 16.

Thinkers (p. 175)**Thinkers (p. 181)**

A traffic light with red, yellow, and green lights.

Thinkers (p. 184)**Any Questions? (p. 185)**

Here are a few ways:

1. MDCCCCLXXXVIII (1000 + 500 + 100 + 100 + 100 + 100 + 50 + 10 + 10 + 10 + 10 + 5 + 1 + 1 + 1 + 1)
2. MCMXCIX (The "subtractive" method: 1000 + 900 + 90 + 9)
3. MCMLXXXIX
4. MCMIC
5. MIM
6. IMM

Are any of these ways "more correct" than others? Who says?

Analyzing Skills

CHAPTER

8

Analyzing, Evaluating, Inducing, and Deducing

Ben E. Johnson

Think About This!

Vital Learning

Many things we learn in life are worth passing on to our children and grandchildren. Interestingly, these valuable things are learned when we are young, not when we are old. What have you learned so far that you would want to pass down to your grandchildren? List five of the most important things.

1. _____

2. _____

3. _____

4. _____

5. _____

Analyzing

ANALYZING: Identifying and separating ideas, attributes, situations, and/or components in order to form a conclusion as to their relationship

It is impossible to go through a single hour in a day without calling on your analyzing skills many times. We are informally, almost instinctively, analyzing all the time. When we are asked questions like the following, we depend on our analyzing skills to help us find correct answers:

- ▶ Which of the following reasons for being late to class and not having completed the assigned paper is your professor going to accept?
- ▶ Which one of the westward islands has a good elevation, is protected from the wind, has fresh water, and is isolated from navigational traffic?
- ▶ Which of the following statements is an unverified assumption on the part of the city council?
- ▶ What are some logical reasons for supporting a balanced-budget amendment?
- ▶ How would you describe the positions taken by both sides in this conflict?

We constantly analyze what we take in with our senses—situations, ideas, things that we read or hear. When we analyze, we attempt to identify the separate components of the situation or thing so that we can form a conclusion as to the relationship between those components.

Thinkers

There is a word in the English language in which the first two letters signify a male, the first three signify a female, the first four signify a great man, and the whole word, a great woman. What is the word?

Need a Hint?

Break this into parts. Take it step by step. What two letters signify a male? What three letters signify a female? And so on.

Quick! Tell Me What This Means

Whenever we try to figure something out, we follow a pattern of thinking that helps us separate the thing into understandable parts so that we can make sense of it. The step-by-step procedure we follow is probably different for everyone, but there are some basics that we all employ:

1. We establish our purpose. Why are we doing this? What are we trying to find out? Determining the purpose shapes the direction and the limits of our thinking.
2. We examine the situation, material, or idea and look for its separate pieces, reasons, or assumptions.
3. We examine the separate parts in light of our purpose.
4. We form conclusions about the parts and about what the sum total of those parts means.

Why Is a Pencil Designed the Way It Is?

Put your powers of analysis to work on the following problem. Follow the preceding four steps and see how they lead you to a logical conclusion based on analysis of the problem.

Problem: Why is a pencil designed the way it is?

1. *Establish your purpose.* What are you trying to figure out? The purpose here is to determine why a pencil is made the way it is.

2. *Look over the item being analyzed.* A pencil consists of a wooden case holding a piece of graphite, which makes marks on paper. Some pencils have erasers attached.
3. *Examine the separate parts in light of your purpose.* What about the material? The wooden case is lightweight, easy to hold and to sharpen. Lead is soft, dark, easy to mark with. Both wood and graphite are cheap. What about the shape? The six-sided shape makes the pencil easy to grip and to pack in boxes, and the pencil won't roll off a surface easily. It's about 20 centimeters long, so it won't wear out quickly.
4. *Form your conclusions based on your observations of the parts.* A pencil is made the way it is because it is cheap to make and buy, and easy to use.

Would you have come to the same conclusion about why pencils are made the way they are without using this four-step guide? Probably (after all, this was a very simple problem), but in all likelihood not as quickly. Notice how using this four-step process of analyzing seems to organize your thinking. Your thinking focuses on specifics and doesn't get stuck on related but unimportant facts (for example, the traditional color of pencils, or their similarity around the world), as so often happens when you don't use the four-step process.

Analyzing an Argument Seems a Bit Tougher

For many college students, the prospect of analyzing an argument or an idea that they encounter in their studies sounds considerably more difficult than analyzing the design of a pencil. That is simply because in high school many students become used to accepting what they are told and what they read without critically examining ideas and arguments. But now, things are different. In college you are expected to critically analyze everything you read and hear. What this means is that you are expected to look at things closely and selectively, interpreting what you see.

How to Analyze an Idea or an Argument

The process of analyzing ideas or arguments has five separate and distinct steps.

1. *Determine your purpose.* What are you trying to find out? You analyze for many different reasons. Do you want to identify the structure of the argument, clarify the reasoning, check the validity of what is said, classify what is being said into logical categories, or simply seek understanding? Your purpose determines how you proceed with your analysis.
2. *Divide the issue or argument into its component parts.* What is the nature of the parts, and what are the parts? Search the material piece by piece, keeping your purpose in mind.
3. *Interpret the relationship of these parts to one another (that is, find the pattern).* What is the relationship of the elements to one another? What is the structure? In what way are these parts connected? Is that connection reasonable and valid?
4. *State the results of your analysis.* What do you conclude? What is the organizational connection of the elements to the whole?
5. *Identify the questions you still have about the issue or argument.* Are there any components left that don't fit? What conclusions does this lead you to? Is there another way of looking at this issue or argument? Are there any examples? Are there some inconsistencies? Is there an alternative?

STIR IT UP 8.1

Select a short story from a literature text or a chapter from a novel and analyze the psychology of one or more of the characters. Explore your character's mind in a one- or two-page essay. Suggest a compatible background for your character that includes a plausible childhood and other events that may account for his or her actions and thoughts. Rely heavily on your inferring skills. In short, answer this question: "Why is this character behaving the way he or she is behaving?"

STIR IT UP 8.2

Analyze your country's foreign policy. How? Professional foreign policy analysts attempt to understand world events as the (usually) purposive acts of government policy makers. They look carefully at events and then work backwards to explain why a government chose the action in question. They are thus able to determine what a government's policy is. Check today's newspaper for articles describing some action or actions of the U.S. government toward another country or group of countries, and then attempt to explain the government's policy or intention concerning that country or group of countries. Identify the country, the incident, and your basic conclusions below. Be ready to explain your thinking.

Any Questions?

You've probably been frustrated by the following riddle before. Read it again, but this time analyze it with the purpose of determining what makes it impossible to solve as it is stated.

Three people shared a hotel room. The room charge was \$30, so each person paid \$10. Later, the desk clerk discovered that she had charged \$5 too much for the room, so she handed the bellhop 5 one-dollar bills and told him to return the money to the three people. The bellhop secretly put \$2 in his pocket and then gave each person \$1. Here's the problem: The three people originally paid \$10 each, but each received \$1 back, so they've now paid a total of \$27 for the room. Add to that the \$2 that the bellhop stole, and you have a total expenditure of \$29 instead of \$30. What happened to the other dollar?

STIR IT UP 8.3

Check with your friends, family members, and professors to see if any of them know by what process decisions are made in a political campaign, government agency, corporation, or school. Ask them how key decisions are made. Are there attempts at analyzing situations to determine policy? How important is the ability to analyze situations to top-level people? Be prepared to discuss your findings in class.

STIR IT UP 8.4

If you aren't already familiar with the punk rock scene, research it by using the library, interviews, the Internet, and other sources. Then write an essay analyzing the current state of the punk rock movement, especially the place of violence in the movement. At the end of the essay, project the punk rock movement's future over the next ten years.

STIR IT UP 8.5

On college tests, you will frequently read directions like the following: "Analyze the trends in economic development since 1945." Analyze that statement and explain what exactly you think the professor is asking you to do.

Thinkers

Time Flies

The day before yesterday, Suzie was nine years old. Next year she will be twelve. How is this possible?

Need a Hint?

Leap year isn't involved, and this isn't as tricky as it seems. Think about having a birthday at the end of a year or the beginning of a year.

America's Addiction to Addictions

Art Levine

U.S. News and World Report, February 5, 1990

When District of Columbia Mayor Marion Barry tearfully announced that he had “weaknesses” and entered a Florida treatment program recently, he and his aides were also launching a political and legal strategy. Barry wanted to portray his addiction problems as a disease—something beyond his control and thus politically less damaging.

By going into treatment for chemical dependency, he stood to gain public sympathy and, he and his advisers hoped, prosecutorial leniency. But Barry's downfall and speedy resort to treatment also raise basic questions about the nature and causes of addictions and the role of individual willpower in curbing excessive behavior.

Most medical experts today view alcoholism and drug addiction as chronic diseases with biological, and perhaps genetic, underpinnings. But it was not that long ago that even these excesses were seen as evidence of moral turpitude rather than medical conditions.

What worries some addiction experts is society's willingness to expand the definition of addictive behavior beyond substance abuse to include a host of excessive behaviors—ranging from shopping to promiscuity—and clinicians' readiness to treat what may be social and willpower problems as medical disorders instead.

Helpless and Sick?

Addiction was once seen primarily as a physical dependence on a drug that created severe physical symptoms when the drug was withdrawn. But that view is changing.

“The drug is necessary but not sufficient to cause addiction,” says Jack Henningfield, chief of the clinical pharmacology branch of the National Institute of Drug Abuse. He and others point to the clear effects of social conditions on drug use: for example, the ability of 90 percent of addicted Vietnam veterans to kick their heroin habits once free of the stress of battle. By contrast, three-fourths of other heroin addicts who try to quit fail.

It is this sort of wide variation in addictive patterns that, in part, prompts some critics to question whether substance abuse is truly a disease with an inevitable course if untreated. Furthermore, they argue, the disease model sends a harmful message to abusers. It not only excuses irresponsibility but “indoctrinates them with the idea they're helpless and sick,” says Herbert Fingarette, an addiction expert at UC-Santa Barbara.

Medical authorities generally dismiss these criticisms, noting that other well accepted diseases, such as diabetes, lack a simple pattern while still having a physical component. They also argue that disease-oriented treatment programs don't absolve patients of responsibility for their habits, though they have biological roots.

“Once a behavior becomes an addiction, it involves a biological component,” points out Dr. Frederick K. Goodwin, a psychiatrist and administrator of the Alcohol, Drug Abuse and Mental Health Administration. But “it starts as a voluntary act, then becomes reflexive and automatic.”

Can any behavior become reflexive and automatic—in effect, an addiction? Some experts are inclined to see addiction in any pleasurable behavior that turns compulsive, despite the problems that can cause.

In part because of this looser definition, addiction chic is everywhere: There are now more than 2,000 meetings each week of groups catering to self-styled sex and love addicts, up at least 20 percent in the past year; there are more than 200 national Alcoholics Anonymous-style groups in the country, including Messies Anonymous; and there are inpatient therapy programs and self-help groups for those people—called “codependents”—whose main problem is that they remain with, and worry too much about, destructive mates.

Whether it is excesses in drug taking or even TV watching, Harvey Milkman, a professor of psychology at Metropolitan State College in Denver and co-author of *Craving for Ecstasy*, argues, “The disease concept may be applied to the entire spectrum of compulsive problem behaviors.”

But the prospect of less personal responsibility concerns critics of the would-be addictions. “Creating a world of addictive diseases may mean creating a world in which anything is excusable,” says psychologist Stanton Peele, author of the new book *Diseasing of America*. Even some addiction researchers are questioning whether the boom in addiction treatments has gone too far.

“It is vogue now to call any excessive behavior an addiction, and, frankly, the professions are too quick to turn a dollar on this,” says Howard J. Shaffer, director of the Center for Addiction Studies at Harvard Medical School and Cambridge Hospital. And none of the often expensive treatments offered for the alleged behavioral addictions has proved effective, experts say.

Yet researchers exploring the disease models of addiction are often genuinely seeking to understand the underpinnings of some self-destructive, repetitive behaviors that trouble individuals—and baffle scientists. How do we explain someone who buys more pairs of shoes than could ever possibly be worn or gambles away the family home and life savings?

The idea of an addictive-personality type has been proposed, but the science is inconclusive. “There is no single characteristic or constellation of traits that is inevitably associated with addiction,” notes psychologist Alan Lang of Florida State University, who contributed a chapter on personality to a National Research Council report on habitual behavior. At the same time, his research review points to such predisposing traits as a sense of alienation, impulsivity and a need for instant gratification.

Despite the controversies over addictions, they have made their way into the legal system as defenses. Defendants claiming “diminished capacity” because of their addictions sometimes succeed: one Vietnam veteran accused of drug running was acquitted after a defense expert argued that he was a victim of the “action-addict syndrome.” “Is every problem a disease?” asks sociologist Martin Levine of Bloomfield College in New Jersey.

It sometimes seems that way. A leading “sex addiction” theorist, Minnesota psychologist Patrick Carnes, has designed the country’s first Sexual Dependency Unit at Golden Valley Health Center in Minnesota.

It has offered both inpatient and outpatient treatment to more than 1,000 people since 1984. The roughly four-week, \$16,000 treatment includes an AA style 12-step program, group therapy and celibacy pledges. The critics of the sex-addiction movement view it more as a moralistic crusade than as a genuine medical effort.

Biological Hints

But for many who consider themselves sex addicts, the damage in their lives can be quite real, even if there is no agreement on what causes their problems. Jamie, a Minneapolis member of Sex Addicts Anonymous, says he lost a few jobs because of his constant search for new sex partners.

“Everything else got in the way,” he says. And there are some hints of a biological basis for such behavior. New York City psychologist William Wedin recalls one patient, a well-paid executive who began spending thousands of dollars a week on prostitutes and joined a 12-step sex-addict program.

It wasn’t until he collapsed on the street one day that doctors diagnosed him as a victim of a stroke, suggesting that an organic brain disorder had probably spurred his flings. Other experts are using anti-depressants to successfully treat sexual compulsives.

Compulsive gambling may pose the greatest theoretical challenge for addiction researchers. Unlike alcoholism and drug addiction, it involves no toxic substance that might directly affect brain chemistry and lead to physical craving. Yet it is well accepted by such groups as the American Psychiatric Association as an addictive syndrome.

The Department of Veterans Affairs offers inpatient and outpatient treatment for gambling at four medical centers. And there may even be a biological factor: In 1988, researchers at the National Institute on Alcohol Abuse and Alcoholism found higher levels of the brain chemical norepinephrine in gamblers, that could signal a mood-regulation disturbance that spurs them to seek greater thrills. It is theoretically possible that others seek the same kinds of rewards through compulsive shopping and sex.

For those who work with such troubled people, the causes are still ultimately mysterious, but Dr. Sheila Blume, who heads the alcohol, chemical-dependency and compulsive-gambling programs at South Oaks Hospital in Amityville, N.Y., says, "I'm hopeful a final pathway in the brain will be found." Until the biology of excessiveness is better understood, America's addiction to addiction will no doubt continue.

EXAMINE YOUR THINKING ABOUT WHAT YOU JUST READ

Pay close attention to your thinking processes as you answer the following questions.

1. Did you notice the many comparisons and contrasts that this writer set up throughout the article? Relying only on your memory, identify a few of the comparisons and contrasts. Then go over the article and put a check mark in the margin wherever a comparison or contrast is made. How many did you find? Why so many? What was the author trying to accomplish by including so many similar or contradictory expert opinions? How does the use of comparisons and contrasts in this article make you feel about the subject?
2. In general, does the use of comparisons and contrasts build credibility in conversations and in writing, or doesn't it matter because credibility rests on something quite different?
3. What are your own views about overindulgence in such things as drugs, sex, shopping, sunbathing, TV watching, eating, and church-going? Can overindulgence in any of these things become an addiction? How important to your definition of *addiction* is the presence of a physical or biological component of some sort?
4. Compare (and contrast) the idea of an addictive-personality type with the idea of a biologically caused addiction. Which is more reasonable? Which is more desirable in terms of social acceptance and treatment?
5. Can an addiction be a good thing? Under what conditions?

Write about this In a brief essay, compare and contrast your ideas on addiction with those of some older person you know well, a parent, a grandparent, or even your employer. For example, how would you characterize your attitudes toward addictions of all types compared to the other person's attitude? Can you agree on what constitutes an addiction? What is the nature of the disagreement? How do you account for the disagreement on the definition of an addiction? How much of this disagreement is a generational thing, or a male-female thing?

Should the Reclamation Project Be Completed?

James R. Hearl

Suppose that the initial cost of a large system of dams and canals to capture water from melting snow in the mountains and move it closer to a population center was estimated to be \$10 billion. Because the benefits, say \$15 billion, were thought to be greater than this amount, the project was started. After spending \$5 billion, the project comes to the Congress for the appropriation necessary to finish it. Congresspeople from the state where the project is being built provide the following data:

Money already spent	\$5 billion
Benefits already obtained	\$12 billion
Total benefits to be obtained if project is finished	\$15 billion

Would you vote to approve the expenditure (assuming there were no competing uses for the money)?

Suppose, instead, these data were presented:

Money already spent	\$5 billion
Benefits already obtained	\$5 billion
Total benefits to be obtained if project is finished	\$9 billion

Would you vote to approve the expenditure?

Finally, suppose that, instead of either of the above, the following data were presented:

Money already spent	\$5 billion
Benefits already obtained	\$2 billion
Total benefits to be obtained if project is finished	\$9 billion

Would you vote to approve the expenditure?

In the first case, the congresspeople from the state argue that having invested \$5 billion in the project with the aim of getting \$15 billion in benefits, “we can’t waste the \$5 billion already spent.” They note that the benefits haven’t changed from the initial estimates and argue that by spending \$10 billion overall, \$15 billion in benefits can be obtained. In the second and third cases, congresspeople from other states argue that the overall benefits are now only \$9 billion and that spending \$10 billion to get \$9 billion in benefits is foolish.

In each case, you should begin by asking what *additional* benefit can be obtained from additional spending—that is, you should find the marginal benefit and the marginal cost. In the first case, the expenditure of an additional \$5 billion results in only an additional \$3 billion in benefits. In the second case, spending an additional \$5 billion results in an additional \$4 billion in benefits. In the third case, spending an additional \$4 billion results in \$7 billion in benefits. Marginal benefits exceed marginal costs only in the last case. It only “makes sense” to spend additional money in this case.

How should you respond to these arguments?

- “We don’t want to waste the \$5 billion already spent.”
- “Overall, we would be spending \$10 billion to get only \$9 billion in benefits.”
- “Overall, we would be spending only \$10 billion to get \$15 billion in benefits.”

The answer is that sunk costs are irrelevant! To see why, note that, in the first case, the net benefit if no additional money is spent is \$12 billion minus the \$5 billion already spent or \$7 billion. Completing the project, however, reduces the net benefit from \$7 to \$5 billion. In the second case, the net benefits if the project is not funded further are \$0 (\$5 billion minus \$5 billion). Completing the project reduces the net benefits to –\$1 billion. In the third case, by contrast, the net benefits now are –\$3 billion, but if the project is completed, the losses will only be –\$1 billion.

READ AND RESPOND

1. In this article, what information is left out of the calculations that might have an influence on the spending decision? Are decisions on projects like this one always made on the basis of a budget? Should they be?
2. How might the calculations be deceptive? What is being assumed or taken for granted?
3. Is the reasoning for each scenario clear, precise, accurate, relevant, consistent, logical, broad, fair, and so forth? If it lacks one of these qualities, what effect does that have on the conclusion?

ASKING CRITICAL QUESTIONS

After you read the article that follows, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the article in proper context and to completely understand what is being said or reported? *On the lines following the article, write three questions that, if answered, will help you understand what is really being said.*

Why the Sky Is Blue and Sunsets Are Red

James T. Shipman, Jerry D. Wilson, and Aaron W. Todd

The gas molecules of the air account for most of the scattering in the visible region of the spectrum. In the visible spectrum the wavelength increases from violet to red. The blue end is therefore scattered more than the red end. (The colors of the visible spectrum—and the rainbow—may be remembered with the help of the name of ROY G. BIV—red, orange, yellow, green, blue, indigo, and violet.)

As the sunlight passes through the atmosphere, the blue end of the spectrum is preferentially scattered. Some of this scattered light reaches Earth, where we see it as blue skylight. Keep in mind that all colors are present in skylight, but the dominant wavelength or color lies in the blue. You may have noticed that the skylight is more blue directly overhead or high in the sky and less blue toward the horizon, becoming white just above the horizon. You see these effects because there are fewer scatterers along a path through the atmosphere overhead than toward the horizon, and multiple scattering along the horizon path mixes the colors to give the white appearance. If Earth had no atmosphere the sky would appear black, other than in the vicinity of the Sun.

Because Rayleigh scattering is greater the shorter the wavelength, you might be wondering why the sky isn't violet, since this color has the shortest wavelength in the visible spectrum. Violet light is scattered, but the eye is more sensitive to blue light than to violet light; also, sunlight contains more blue light than violet light. The greatest color component is yellow-green, and the distribution generally decreases toward the ends of the spectrum.

The scattering of sunlight by the atmospheric gases and small particles give rise to red sunsets. One might think that because sunlight travels a greater distance through the atmosphere to an observer at sunset, most of the shorter wavelengths would be scattered from the sunlight and only light in the red end of the spectrum would reach the observer. However, the dominant color of this light, were it due solely to molecular scattering, would be orange. Hence additional scattering by small particles in the atmosphere must shift the light from the setting (or rising) Sun toward the red. Foreign particles (natural or pollutants) in the atmosphere are not necessary to give a blue sky, and even detract from it. Yet they are necessary for deep red sunsets and sunrises.

The beauty of red sunrises and sunsets is often made more spectacular by layers of pink-colored clouds. The cloud color is due to the reflection of red light.

Larger particles of dust, smoke, haze, and those from air pollution in the atmosphere may preferentially scatter long wavelengths. These scattered wavelengths, along with the scattered blue light due to Rayleigh scattering, can cause the sky to have a milky blue appearance—white being the presence of all colors. Hence the blueness of the sky gives an indication of atmospheric purity. Cloud droplets and raindrops scatter even longer wavelengths. This fact is used in the principle of weather radar, which is an important means of weather monitoring.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Evaluating

What questions am I going to have answered in this section on evaluating?

1. What are we doing when we evaluate, and how is this different from forming an opinion?
2. Why can't we evaluate if we have not established evaluation criteria?
3. How much evaluation is there in most advertisements and in book, concert, music, and movie reviews?

EVALUATING: Appraising something according to certain criteria and forming a judgment as to its worth or quality

When we employ the thinking skill of evaluation, we are expressing our conclusions about such things as the appropriateness of underlying assumptions, the accuracy of reporting, the credibility of sources, the authority of someone or some idea, and the relevancy, consistency, appropriateness, and value of evidence. In the process, we are also giving clues to our preferences, our attitudes, our likes and dislikes, our values. What sets evaluation apart from opinion is the *foundation of criteria* on which the evaluation rests and which is missing when we merely express our opinion or attitude.

In order for evaluation to be evaluation, *justifiable criteria* must be offered for the evaluations made, and all evaluations must be set forth *in the light of those criteria*. It is not sufficient in evaluation to say, "The play is bad"; "That book is great"; "The solution is inadequate." We must also indicate our criteria for such judgments. It is a sign of immaturity in thinking for students to make statements like these and then, when asked why, to answer, "Because . . . just because." It is always important to know—and sometimes to indicate—the standards or criteria that are being used for an evaluation. Otherwise, the evaluation may be simply "opinionating" and lack value or authority.

Think About This!

Mental Fitness

Sometimes we need to encourage ourselves to begin thinking critically because we tend to function most of the time in an unthinking, basic response mode. Real learning in college requires that we be ready to think critically all the time, not just occasionally. So, how do we keep ourselves mentally fit?

One way is to raise one or more questions each day that require us to use our many different thinking abilities. For example, starting your day with a glass of orange juice (Is it really orange, or should it be called yellow juice?) and a provocative question that you attempt to answer—or find the answer to—will do wonders for your mental muscles over a period of time.

Try questions like these:

Why do whitecaps form on bodies of water, and why are they white?

Why does a piece of chalk produce a terrible squeal if you hold it in a certain way?

Does a Frisbee have to be spinning to work?

Why do fish travel in schools?

Why does the moon seem larger near the horizon?

How do microwave ovens cook meat?

What questions of your own (and better than these, of course) can you suggest for keeping mentally fit? Where can you find more entertaining, thought-provoking questions?

We are faced with the need to evaluate in all parts of our daily lives. Note the need for establishing or knowing specific evaluation criteria when called upon to answer ordinary questions like these:

- ▶ What kind of puppy should we choose if we want to select the right puppy for our family?
- ▶ How do age, condition, and mileage affect the value of an automobile?
- ▶ How should the state of Florida proceed in its nuclear energy development program in light of the potential risks to the environment discussed in paragraph 3 on page xxx?

Establishing Evaluation Criteria

We continually evaluate people, ideas, objects, plans, experiences, relationships, and everything else in life. It is through the thinking skill of evaluation that we determine what is worthwhile and what we want to make a part of our lives and of our thinking. Every time we evaluate something we evaluate it against one or more criteria that we have established. It would be nice if we could use the same set of criteria for evaluating everything, but we can't. Different kinds of evaluation require different evaluation criteria. It is the careful establishment of evaluation criteria that allows the evaluation process to work. Consequently, whenever we are called upon to evaluate, we must follow essentially the same steps:

1. Determine exactly what we are going to evaluate.
2. Identify the criteria to be used in the evaluation. (We can use an existing set of criteria or create our own.)
3. Illustrate these criteria by descriptive limits or examples.
4. Examine the situation or information against each criterion.
5. Determine the extent to which the situation or information matches the criteria.
6. State a judgment.

Thinkers

If these two sets of numbers were added up, which sum would you estimate to be greater, the one on the left or the one on the right? Why?

987654321	123456789
87654321	12345678
7654321	1234567
654321	123456
54321	12345
4321	1234
321	123
21	12
1	1

Need a Hint?

What does the arrangement of the numbers have to do with the sum of the numbers?

STIR IT UP 8.6

Follow the steps outlined on page 387 and establish evaluation criteria for each of the following tasks. Be ready to describe the thinking that led to your criteria selection. How reasonable and appropriate are your criteria in each case?

1. Task: selecting a boyfriend/girlfriend

Criteria: _____

2. Task: selecting a college major/vocation

Criteria: _____

3. Task: selecting a used car

Criteria: _____

4. Task: determining what is "art"

Criteria: _____

Any Questions?

Is there any way to gauge a person's intellectual ability without subjecting him or her to a battery of "intelligence" tests?

STIR IT UP 8.7

Assume that you are now able to purchase your first house. First, establish your criteria for evaluating any house to determine if it fits your needs. After you have written down your criteria on the lines below, go to any real estate office in your area, or pick up one of those free publications that show pictures of houses for sale. Select one or more houses that meet your criteria, and bring pictures of the house(s) to class for discussion. Be ready to discuss how easy or difficult it was to stick to your criteria.

Criteria: _____

Substituting Gasoline Purchased in the Suburbs for Gasoline Purchased in the City

James R. Kearl

In August 1980, city officials in Washington, D.C., imposed a 6 percent excise tax on gasoline in an effort to generate tax revenues. It was assumed that the price of gasoline would increase by about 6 percent but that the amount of gasoline sold wouldn't change by much. It was also assumed that the price increase would directly accrue to the city as tax revenues. By November 1980, however, the amount of gasoline sold in the city had fallen by 33 percent. A 6 percent price increase together with a 33 percent quantity decrease is equivalent to a price elasticity of demand of 5.5! And this was only a short-run

response to the price change. Because of the decline in sales, tax revenues did not increase. Gasoline dealers in the city were hurt as well.

An elasticity of 5.5 suggests massive substitution. But what would be a good substitute for gasoline? It was the gasoline sold in the neighboring Virginia and Maryland suburbs. Thus, as gasoline stations in the District attempted to increase price in order to cover the new tax, they provided an incentive for individuals to find lower-priced substitutes for their gasoline. Since a larger portion of the automobiles driven in Washington, D.C., are driven into the city each day by commuters from neighboring Maryland and Virginia, substitutes were readily available. Drivers 'apparently purchased gasoline before they left for D.C. in the morning, after they returned to the suburbs in the evening, or on weekends.

The tax was repealed in December 1980, just months after it was imposed. During the discussion about its repeal, a D.C. councilman observed:

We tend to think of ourselves here in the District as an island to ourselves. But we've got to realize that we're not. We've got to realize that Maryland and Virginia are right out there, and there's nothing to stop people from crossing over the line.

The mayor, when announcing the repeal of the tax, suggested that there was overwhelming evidence the tax had not worked. Rather, it had caused undue hardships both for consumers of gas and for those who operate retail gas businesses.

READ AND RESPOND

1. What was the reasoning that led to the 6 percent excise tax on gasoline? What was wrong with the reasoning? What wasn't taken into consideration?
2. What could the D.C. officials have done to check their assumptions and reasoning before implementing the tax?

Diary of an Unknown Aviator (1918)

Anonymous

We've lost a lot of good men. It's only a question of time until we all get it. I'm all shot to pieces. I only hope I can stick it. I don't want to quit. My nerves are all gone and I can't stop. I've lived beyond my time already.

It's not the fear of death that's done it. I'm still not afraid to die. It's this eternal flinching from it that's doing it and has made a coward out of me. Few men live to know what real fear is. It's something that grows on you, day by day, that eats into your constitution and undermines your sanity. I have never been serious about anything in my life and now I know that I'll never be otherwise again. But my seriousness will be a burlesque for no one will recognize it. Here I am, twenty-four years old, I look forty and I feel ninety. I've lost all interest in life beyond the next patrol. No one Hun will ever get me and I'll never fall into a trap, but sooner or later I'll be forced to fight against odds that are too long or perhaps a stray shot from the ground will be lucky and I will have gone in vain. Or my motor will cut out when we are trench strafing or a wing will pull off in a dive. Oh, for a parachute! The Huns are using them now. I haven't a chance, I know, and it's this eternal waiting around that's killing me. I've even lost my taste for licker. It doesn't seem to do me any good now. I guess I'm stale. Last week I actually got frightened in the air and lost my head. Then I found ten Huns and took them all on and I got one of them down out of control. I got my nerve back by that time and came back

home and slept like a baby for the first time in two months. What a blessing sleep is! I know now why men go out and take such long chances and pull off such wild stunts. No discipline in the world could make them do what they do of their own accord. I know now what a brave man is. I know now how men laugh at death and welcome it. I know now why Ball went over and sat above a Hun airdrome and dared them to come up and fight with him. It takes a brave man to even experience real fear. A coward couldn't last long enough at the job to get to that stage. What price salvation now?

War is a horrible thing, a grotesque comedy. And it is so useless. This war won't prove anything. All we'll do when we win is to substitute one sort of Dictator for another. In the meantime we have destroyed our best resources. Human life, the most precious thing in the world, has become the cheapest. After we've won this war by drowning the Hun in our own blood, in five years' time the sentimental fools at home will be taking up a collection for these same Huns that are killing us now and our fool politicians will be cooking up another good war. Why shouldn't they? They have to keep the public stirred up to keep their jobs and they don't have to fight and they can get soft berths for their sons and their friends' sons. To me the most contemptible cur in the world is the man who lets political influence be used to keep him away from the front. For he lets another man die in his place.

The worst thing about this war is that it takes the best. If it lasts long enough the world will be populated by cowards and weaklings and their children. And the whole thing is so useless, so unnecessary, so terrible! . . .

The devastation of the country is too horrible to describe. It looks from the air as if the gods had made a gigantic steam roller, forty miles wide and run it from the coast to Switzerland, leaving its spike holes behind as it went. . . .

I've lost over a hundred friends, so they tell me—I've seen only seven or eight killed—but to me they aren't dead yet. They are just around the corner, I think, and I'm still expecting to run into them any time. I dream about them at night when I do sleep a little and sometimes I dream that some one is killed who really isn't. Then I don't know who is and who isn't. I saw a man in Boulogne the other day that I had dreamed I saw killed and I thought I was seeing a ghost. I can't realize that any of them are gone. Surely human life is not a candle to be snuffed out. . . .

READ AND RESPOND

1. This is a gripping piece of reading. But what was it that gripped you? Was it the despair, the knowing that the aviator would in all likelihood be killed soon? Was it the courage? Was it the questioning of the war itself? What was it?
2. The writer had some pretty pointed things to say about courage, fear, cowards, politicians, and even about the future population of the world. How much of what he said do you agree with? How much of your agreement is based on what you believed before you read this article, and how much of your agreement is based on emotions inspired by the article?
3. How would you characterize the writer's psychological and emotional state of mind? Support your answer with reasons and examples. On what do you base your inferences?
4. Did the writer make it back alive? How do you know?

Think About This!

Start Now!

You are captured by a mad scientist, who gives you two hourglasses. One measures exactly four minutes, the other measures exactly seven minutes. The mad scientist (who values critical thinking and problem solving puzzles) says you must tell when exactly nine minutes have passed. If you can do this, you may go free. If you can't, you will be forced to wash test tubes for the rest of your life.

The mad scientist yells, "Start now!"

What must you do *immediately* in order to stand a chance of surviving? Record your answer here before reading any further.

What you must do immediately is turn the hourglasses over. If you don't, you will miss your chance to solve the problem because some time will slip away before you do. Even if you figure out in a couple of minutes how to solve the problem, you can't make up those two minutes. When the mad scientist said "now," he meant now. While the sand is dropping, you can use the time to think and to solve the problem.

Now, figure out how to use the hourglasses to measure exactly nine minutes. You can do it.

Inducing

INDUCING: Analyzing individual facts or premises in order to derive a general conclusion

When we reason inductively we start with specific premises, evidence, details, and facts. Then we use these specifics in our thinking process to formulate inferences and conclusions of a broad and general nature. Much of the learning you do in all subject areas in college is strongly dependent on inductive thinking. You go from observations to inferences. Without thinking inductively, all you do in college is learn isolated premises, memorize facts, and rely on memorization and recall for answers to factual questions and solutions to factual problems. Inductive reasoning is a way of obtaining information. We reason inductively when we arrive at a conclusion about a broad group after we have examined a sample of the group. When it is impossible to examine all the data, we extrapolate from the data that we have. With inductive thinking, we can take limited evidence about some members of a class or about the facts of a problem in order to form a conclusion about all members of the class or to arrive at a probable solution for the problem.

In reasoning inductively, scientists work from a collection of *particular* events to formulate *general* principles. In other words, they use unifying concepts to link events that were previously not seen as related to one another. Thus, they try to establish a logical completion for the sentence "All these things happen as they do because _____."

Thinkers

What five-letter word becomes shorter when you add two letters to it? There is only one possibility.

Need a Hint?

A trick question, but also a *literal* question.

We Start with Observation

We start by observing something, by acquiring and understanding the basics, the premises, facts, details, and specific information about it. Then we move to arranging and combining the individual pieces of information so that we can see a pattern, draw inferences, and come to a conclusion, understand a situation or event, or formulate a principle or a rule. In the practice of medicine, doctors rely heavily on inductive thinking. They look at the evidence—the symptoms—in order to come to a conclusion—a diagnosis. The diagnosis is the *general* principle formulated from the *particular* symptoms. Inducing is a way of accounting for and understanding how the specifics go together in order to produce the whole.

Inducing broad truths, observations, or conclusions from individual facts permits us to answer questions like the following. (Remember, though, that if the facts are in error, anything we induce from them may be in error.)

- ▶ After hearing what the weather forecaster said about conditions outside, will you need to bring your umbrella, your bathing suit, or your mittens?
- ▶ Given the conditions described in the reading selection, which diseases are likely to thrive?
- ▶ From your observations of them, can you tell which of those four people is likely to be the owner of the gold coins, the diamonds, the rare paintings, and the expensive cars?
- ▶ A poll reported that 82 percent of the people surveyed disliked people smoking near them while they were eating. What does that suggest to you about the feasibility of having more nonsmoking sections in restaurants?
- ▶ If the three interviewers got conflicting descriptions of the robber from the three witnesses, what is the likelihood that the authorities will ever get an accurate or usable description?

You will note that in each case, these questions depend for their answers on inferring, on combining specific facts so as to arrive at a broad conclusion that encompasses more than the facts or premises stated. Frequently we see this inductive thinking at work when people interpret polls or new product surveys. Pollsters and marketers ask selected individuals specific questions. Their answers are then used to predict the success of a product or the outcome of an election. Inductive thinking occurs regularly during televised election-day voting coverage. Network experts predict the winners after interviewing a limited number of voters. This representative sampling of voters allows for an inference, a prediction, as to the winner of the race. It is important that these inferences be probable, not improbable, and arise out of the facts of a situation. Because inductive thinking relies on probable inferences, our conclusions can be probable, but they are seldom totally certain.

STIR IT UP 8.8

In forming inferences, we need to be responsible in our interpretations. Read the following brief scenario and then take the quiz to see if you can distinguish between what is *definitely* true or false (a fact) from what is *probably* true or false (an inference).

Heidi and Alice are driving when they see an older model car pulled over at the side of the road. The rear end of the car is smashed in and a side window is broken. There is a man in front of the car. He is doubled over, swaying slightly, violently ill. He stands up straight as they pass, watching them, but doesn't indicate any need for help. "Obviously a drunk," says Alice. "I hope he makes it home safely," says Heidi.

- | | |
|--|---|
| 1. In brief, this story is about observing a car and driver at the side of the road. | T ☐ F ☐ |
| 2. The wrecked car was undrivable. | T ☐ F ☐ |
| 3. The wrecked car had no passengers. | T ☐ F ☐ |
| 4. The driver was drunk. | T ☐ F ☐ |
| 5. Heidi was driving; Alice was the passenger. | T ☐ F ☐ |
| 6. There were no other cars on the road. | T ☐ F ☐ |
| 7. The man standing in front of the car was the driver. | T ☐ F ☐ |
| 8. Heidi was concerned for the driver; Alice wasn't. | T ☐ F ☐ |
| 9. Heidi and Alice stopped at a pay phone and called the police. | T ☐ F ☐ |
| 10. The scene at the side of the road upset Heidi and Alice. | T ☐ F ☐ |

Look at your answers. Were you able to differentiate between what was clearly a fact and what was an inference? Were there some *unlikely* inferences, that is, statements that were possibly true but probably not true?

Why Did That Happen?

Another common form of inductive thinking (sometimes called *causal* thinking or reasoning) occurs when we ask questions such as, Why did that happen? Why did that accident occur? Why did the clothes dryer stop working? Why do I have such a bad headache? Why did the fish stop biting? Why are our winters much colder in recent years? We frequently observe (or experience) an event, a happening of some sort, a problem, and then attempt to determine the cause. The procedure we follow is the process of inductive thinking. We compile data related to the problem, analyze and evaluate the data in light of the question raised, and then infer or conclude the answer. As with all inductive thinking, the process moves from gathering and analyzing individual facts to forming a general conclusion based on them.

When we attempt to state why something happened, the correctness of our conclusion depends on whether or not we can answer yes to the following questions:

1. Are all the related facts or events known?
2. Are these facts or events sufficient to arrive at a conclusion or inference that answers the question "Why did that happen?"
3. Does the conclusion or inference arrived at (the answer to the question) arise naturally and logically from the facts or events?

Any Questions?

You come to a fork in the road on the way to Hana and meet two men. One man is from Hana and the other is from Anah. You know that one man always tells the truth and the other always lies. But you don't know who is the liar and who is the truth teller. To get to Hana, you can ask only one question of the men. What should that question be?

The Scientific Method

Inductive thinking is the foundation for much thinking that has helped us understand and live in our complex world. Early in our education most of us were introduced in our science classes to the *scientific method*. This is a systematic procedure that relies on inductive thinking in order to discover causal relationships. The steps in the scientific method are as follows. A real-life problem is used to illustrate the thinking that takes place.

1. *Identify the event or events to be investigated.* Example: The fish have not been biting for the last month in the Gulf waters near my home.
2. *Gather information about the event or events.* I use lures, not live bait. The water is very warm. I fish in the early evenings, after work. No one else usually fishes at that time. In past months I often used to catch fish.
3. *Develop a theory or hypothesis (a conclusion derived from inductive reasoning) to explain what is happening.* Possible explanations for not catching fish are:
I'm using the wrong bait.
The water is too warm.
I'm fishing at the wrong time of day for this season.
4. *Test the theory or hypothesis through experimentation.* Of the possible explanations listed above, I can rule out the bait because I used the same bait in the past and caught fish. It's probably not water temperature because it is only a few degrees warmer than it was a few months ago when I caught fish. Perhaps I'm fishing at the wrong time of day for the season. That seems the most reasonable theory to test. It can be tested a couple of ways. I'll ask other people when they fish and when the fish are biting best, and I'll go fishing at different times of the day.
5. *Evaluate the theory or hypothesis.* The theory that I was fishing at the wrong time of the day was correct. I evaluated the theory by going fishing several times earlier in the day, and each time I caught something.

As you can see from these steps, and as you may remember from your experiences in school, the scientific method leads thinkers step by step in inducing causal relationships, first analyzing individual facts or premises, then deriving a general conclusion, and then testing the accuracy of the conclusion.

STIR IT UP 8.9

Select one of the following situations and analyze it by working through the steps of the scientific method described above.

You drove to school, parked your car, and went to class, but now your car won't start. What's wrong?

You are having a hard time passing the quizzes and exams in one of your courses. What's wrong?

Some of your clothes seem to be missing from your dormitory room closet. What is happening?

Step 1: Describe the situation. _____

Step 2: Gather information. (Details? Possible causes?) _____

Step 3: What's your theory about what's happening? (What is the likely reason?) _____

Step 4: Test your theory. (How can you test your theory?) _____

Step 5: Evaluate your theory. (Results? Do you accept or reject your theory?) _____

Our Daily Life Is Not a Pleasant One

Anonymous

I am thirty-five years old, married, the father of four children, and have lived in the coal region all my life. Twenty-three of these years have been spent working in and around the mines. My father was a miner. He died ten years ago from "miners' asthma [black lung disease]."

Three of my brothers are miners; none of us had any opportunities to acquire an education. We were sent to school (such a school as there was in those days) until we were about twelve years of age, and then we were put into the screen room of a breaker to pick slate. From there we went inside the mines as driver boys. As we grew stronger we were taken on as laborers, where we served until able to call ourselves miners. We were given work in the breasts and gangways. There were five of us boys. One lies in the cemetery—fifty tons of top rock dropped on him. He was killed three weeks after he got his job as a miner—a month before he was to be married.

In the fifteen years I have worked as a miner I have earned the average rate of wages any of us coal heavers get. To-day I am little better off than when I started to do for myself. I have \$100 on hand; I am not in debt; I hope to be able to weather the strike without going hungry.

I am only one of the hundreds you see on the street every day. The muscles on my arms are no harder, the callous on my palms no deeper than my neighbor's whose entire life has been spent in the coal region. By years I am only thirty-five. But look at the marks on my body; look at the lines of worryment on my forehead; see the gray hairs on my head and in my mustache; take my general appearance, and you'll think I'm ten years older.

You need not wonder why. Day in and day out, from Monday morning to Saturday evening, between the rising and the setting of the sun, I am in the underground workings of the coal mines. From the seams water trickles into the ditches along the gangways; if not water, it is the gas which hurls us to eternity and the props and timbers to a chaos.

Our daily life is not a pleasant one. When we put on our oil soaked suit in the morning we can't guess all the dangers which threaten our lives. We walk sometimes miles to the place—to the man way or traveling way, or to the mouth of the shaft on top of the slope. And then we enter the darkened chambers of the mines. On our right and on our left we see the logs that keep up the top and support the sides which may crush us into shapeless masses, as they have done to many of our comrades.

We get old quickly. Powder, smoke, after-damp, bad air—all combine to bring furrows to our faces and asthma to our lungs.

I did not strike because I wanted to; I struck because I had to. A miner—the same as any other workman—must earn fair living wages, or he can't live. And it is not how much you get that counts. It is how much what you get will buy. I have gone through it all, and I think my case is a good sample.

I was married in 1890, when I was 23 years old—quite a bit above the age when we miner boys get into double harness [married]. The woman I married is like myself. She was born beneath the shadow of a dirt bank; her chances for school weren't any better than mine; but she did have to learn how to keep house on a certain amount of money. After we paid the preacher for tying the knot we had just \$185 in cash, good health and the good wishes of many friends to start us off.

Our cash was exhausted in buying furniture for housekeeping. In 1890 work was not so plentiful, and by the time our first baby came, there was room for much doubt as to how we would pull out. Low wages, and not much over half time in those years, made us hustle. In 1890–91, from June to May, I earned \$368.72. That represented eleven months' work, or an average of \$33.52 per month. Our rent was \$10 per month; store not less than \$20. And then I had my oil suits and gum boots to pay for. The result was that after the first year and a half of our married life we were in debt. Not much, of

course, and not as much as many of my neighbors, men of larger families, and some who made less money, or in whose case there had been sickness or accident or death. These are all things which a miner must provide for.

I have had fairly good work since I was married. I made the average of what we contract miners are paid; but, as I said before, I am not much better off than when I started.

In 1896 my wife was sick eleven weeks. The doctor came to my house almost every day. He charged me \$20 for his services. There was medicine to buy. I paid the drug store \$18 in that time. Her mother nursed her, and we kept a girl in the kitchen at \$1.50 a week, which cost me \$15 for ten weeks, besides the additional living expenses.

In 1897, just a year afterward, I had a severer trial. And mind, in those years, we were only working about half time. But in the fall of that year one of my brothers struck a gas feeder. There was a terrible explosion. He was hurled downward in the breast and covered with the rush of coal and rock. I was working only three breasts away from him and for a moment was unable to realize what had occurred. Myself and a hundred others were soon at work, however, and in a short while we found him, horribly burned over his whole body, his laborer dead alongside of him.

He was my brother. He was single and had been boarding. He had no home of his own. I didn't want him taken to the hospital, so I directed the driver of the ambulance to take him to my house. Besides being burned, his right arm and left leg were broken, and he was hurt internally. The doctors—there were two at the house when we got there—said he would die. But he didn't. He is living and a miner today. But he lay in bed just fourteen weeks, and was unable to work for seven weeks after he got out of bed. He had no money when he was hurt except the amount represented by his pay. All of the expenses for doctors, medicine, extra help and his living were borne by me, except \$25, which another brother gave me. The last one had none to give. Poor work, low wages and a sickly woman for a wife had kept him scratching for his own family.

It is nonsense to say I was not compelled to keep him, that I could have sent him to a hospital or the almshouse. We are American citizens and we don't go to hospitals and poorhouses. . . .

READ AND RESPOND

1. What qualities of character, what values do you see in the coal miner who wrote this article? What does he mean when he says, "We are American citizens and we don't go to hospitals and poorhouses"?
2. What does the writer seem to take for granted about his life?

Public Lands and Harvesting Trees

James R. Kearl

There are more trees in forests in the United States today than there were in 1920. There are three reasons: First, oil and gas replaced fireplaces and stoves. Second, cars, trucks, and tractors replace horses—one-third of agricultural land was used to feed the horses and much of that land has since been converted back into forest land. Third, advances in seeds and fertilizers mean that less land is needed for growing food and, again, much of the land that is no longer used now grows trees once more.

About 72 percent of the timberland in the United States is privately owned. The remainder is managed by the U.S. Forest Service, which sells millions of trees from 122 national forests, but loses as much as \$200 million each year. For the most part, national forests are in areas where costs are higher to harvest timber. Then why is this land logged? The reason is that the Forest Service sells the timber at prices below the

cost of harvesting on private lands. Critics claim that the Forest Service hides the true costs in several ways:

1. Although roads last for 25 years, it amortizes them over 100 years or more. (One road in Alaska was amortized over 1,800 years, leading one critic to note that if this were true, the current Italian government would still be paying for the Appian Way.)
2. It does not include the \$110 million payroll for Forest Service employees.
3. It omits the costs of land surveys and road work.
4. It pays money to local governments in lieu of taxes, but does not deduct these expenditures from the income it receives from selling trees.

Including these costs turns the Forest Service's estimated \$630 million net revenue into a \$120 million net revenue loss (critics' estimate).

Although the Forest Service does admit that not all national forest timber sales result in positive net revenue, it argues that jobs would be lost if it were to cease below-cost sales. Critics respond that because the demand for wood will not change, the jobs will simply be relocated to private timberland.

READ AND RESPOND

1. What issue is addressed in this article? State your answer in fewer than ten words. Explain why you think your answer is correct.
2. What evidence, information, or data are presented? Does the information help clarify the arguments set forth in this article? If not, why not?
3. The article suggests that the Forest Service hides the true costs of selling timber by citing four examples. Look at the sequence of the examples. Are they arranged in any special order? If so, what impact is the sequence supposed to have? What other sequence might be used for the same examples? What would be the intended effect if you arranged them differently? Explain your thinking.
4. How does the information in this article correspond to your beliefs about our nation's timber resources and about the activities of the Forest Service?

Asking Critical Questions

After you read the articles that follow, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the articles in proper context and to completely understand what is being said or reported? *On the lines following each article, write three questions that, if answered, will help you understand what is really being said.*

The Gaia Hypothesis

Joseph Levine and Kenneth Miller

James Lovelock, a British biochemist, and his American colleague Lynn Margulis do not believe that long-term constancy in Earth's temperature and the life-sustaining levels of oxygen in the atmosphere have arisen incidentally.

Life's influence on planetary conditions struck Lovelock as so powerful and so precisely regulated that he proposed the *Gaia hypothesis*. According to Lovelock, "the physical and chemical condition of the earth's surface of the atmosphere, and of the oceans has been and is actively made fit and comfortable by the presence of life itself."

His hypothesis rests on evidence that living organisms *interact* with, and powerfully affect, Earth's atmosphere and geochemical cycles. Lovelock goes further, however; he proposes that all life on Earth has evolved into a global superorganism—Gaia—whose parts monitor and manipulate carbon dioxide concentration, oxygen levels, and other environmental parameters. He argues that only this active monitoring and correction keep global conditions within the narrow margins essential for life.

In this view, Gaia's atmosphere and oceans act like a global circulatory system, carrying compounds across the globe and dumping them where necessary. Plants and animals living and dead process and store such critical compounds as oxygen and carbon dioxide, releasing them as necessary to control Earth's temperature and atmospheric composition.

Homeostasis is the term physiologists use to describe an organism's maintenance of stable internal conditions in the face of a changing external environment. Lovelock was bold enough to propose that this global superorganism has actively maintained planetary homeostasis over the 3.5 billion years it has been alive.

The Gaia hypothesis is controversial, but it is extremely useful as an alternative point of view. It reminds us that though we tend to think of Earth as stable, we as living organisms have altered it in many ways. What will come of those changes no one knows. In the meantime, Lovelock's ideas can help us view the evolution of life and the physical evolution of Earth not as two separate series of events but as a single, tightly integrated process.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Income and Substitution Effects and the Design of Public Policy

James R. Kearl

When OPEC reduced the supply of oil to the United States in 1974, a number of policies directed at reducing United States dependence on imported oil were proposed. One proposal was a tax on gasoline. Such a tax was thought to be politically unpopular because it would further increase the price of gasoline and reduce real income. To offset this political problem, the proponents of the tax increase suggested that the full amount of the tax revenue received by the government be rebated to gasoline consumers. Consumers would pay higher prices for gasoline but would receive the tax they paid back from the government. This appears to be nonsense because, from the consumers' perspective, it appears to be a wash—more money in total is spent on gasoline on the one side, reducing demand, but the same amount of money comes back on the other side, increasing demand. Can any sense be made of this proposal?

It turns out that because of income and substitution effects, the effect of the tax would probably be different than the effect of the tax rebate. The tax would increase the relative price of gasoline. As a consequence, individuals would use less gasoline. This would reduce the reliance on imported oil—an objective of the policy. The rebate would increase money income. If a mechanism could be worked out to ensure that each consumer would receive exactly what he or she paid in gasoline taxes, the average consumer could afford to purchase just as much gasoline. Yet because gasoline would be relatively more expensive, most consumers would use part or all of the rebate for other things, not gasoline.

MY CRITICAL QUESTIONS

1. _____ ?
2. _____ ?
3. _____ ?

Deducing

DEDUCING: Applying general principles or a broad framework to a situation in order to come to a conclusion about it

You have just read about the thinking skill of inducing. You learned that when thinking inductively about specifics, you can infer broad conclusions, generalizations, and principles. Deducing is related, but different. Deducing is a particularly useful analyzing skill that is a kind of mirror image of inducing. When deducing, you move from an understanding of the general principle to conclusions about related specifics. Deductive reasoning can be employed to make predictions from the general statements, principles, or hypothesis believed to be true. You will soon see that a broad conclusion, generalization, or principle reached through inducing can be used as the general premise in deductive applications.

Isn't This Another Name for Formal Argumentation?

Deductive thinking is frequently associated with the study of logic, especially the several forms of *formal argumentation* that demonstrate reasoning. In formal argumentation the focus is on the basic patterns of deductive argumentation, with their complex system of rules.

Think About This!

There's Guessing, and Then There's Educated Guessing

In order to encourage his university students to think, Enrico Fermi, winner of the Nobel Prize for his work in elementary particle physics, conducted the following discussion based on making educated guesses.

"How many piano tuners are there in Chicago?"

Silence in the room.

"OK, then how many people live in Chicago?"

"Three million."

"How many people in an average family in Chicago?"

"Say an average of four."

"How many families own pianos?"

"One out of three."

"How many pianos, then, in Chicago?"

"Approximately 250,000."

"How often would each piano be tuned?"

"Once every ten years. Thus, 25,000 pianos are being tuned each year."

"How many pianos can a tuner tune in a day?"

"Four."

"How many working days are there each year?"

"About 250."

"How many pianos can one piano tuner tune in one year?"

"Four times 250 working days per year means that each piano tuner could tune 1,000 pianos a year."

"How many piano tuners can make a living tuning pianos in Chicago?"

"With 25,000 tunings available per year, this would mean that there should be approximately 25 piano tuners working at any one time in Chicago."

A check of the Chicago Yellow Pages showed that number to be very close to the number of tuners listed.

Why did this procedure work, even though the answer arrived at was only an approximation? What made students end up with the "correct" answer? What was Fermi trying to show his students?

Any Questions?

Sometimes the solution to a problem can seem obvious when it is not. Now, having read that, answer the following question: If it takes London's Big Ben 30 seconds to chime six o'clock, how long does it take to chime twelve o'clock?

Thinkers

What's Next?

What is the next letter in the following sequence?

OTTFSS

Need a Hint?

This is really a math problem.

You will be glad to know that we are not going to get into formal argumentation here. Instead, we are going to focus on the application of *informal* deductive thinking to everyday conversations, experiences, and readings. That should be a relief to those of you who have had experience with formal deductive argumentation.

Applying the General Truth to Particular Cases

When we use the thinking skill of deduction, what we are reasoning from broad, general awareness or from overarching concepts and principles. In brief, we are reasoning from the general to the specific. Simply put, in deducing we are stipulating the truth of a general statement and applying that truth to one or more related particular cases. The challenge in deductive thinking is to be certain that the general truth or statement actually applies to the particular cases and to avoid the many thinking fallacies that are associated with deductive thinking.

In the following list there is a principle or general concept stated or implied, and then a specific question is asked that requires you to apply that principle or information to a particular case. Do you see how each item is a valid application of a general truth applied to a specific situation?

- ▶ Sweet foods with lots of sugar in them are not good for you. Which of the foods listed below are not good for you? (In this case, the particular foods must each be measured against the "lots of sugar" condition to determine which foods on the list are not good for you.)
- ▶ The First Amendment to the Constitution guarantees free speech. In which of the following situations would the speaker be protected by this amendment? (Each situation must be analyzed in light of the free speech guarantee.)

- If radiation can cause cancer, as indicated by extensive research, then which of the following illnesses best justifies the use of radiation? (Since we accept the truth of the statement that radiation can cause cancer, we must look at the specific illnesses to see which illness is already so serious that the potential benefit of the treatment outweighs the threat of cancer.)

To Deduce You Rely on What You Already Know

Most of us already reason deductively for situations we encounter every day. We have broad frameworks of understanding—things we “know”—against which we measure new situations. For example, our inductive thinking process works something like this:

Broad framework: The majority of high school students who get called to the office during class are in trouble or have an emergency at home.

Specific situation: Tiffany, a student in class, got called to the office.

Specific situation: Tiffany has never been called out of class before.

Specific situation: Tiffany never gets into trouble in school.

Deductive conclusion: Tiffany probably has a family emergency.

Now Figure This Out

Since we already make use of our deductive thinking skills, why is deducing included in this book? You can figure out the answer to this question by simple deduction:

Broad framework: The book discusses only the things we don’t know well or don’t know well enough.

Specific situation: We already make use of the deductive thinking skill.

Specific situation: This book discusses deduction.

Deductive conclusion: We must not know or use our deducing skills well enough.

STIR IT UP 8.10

A Sock in the Dark

You wake up for an early morning class. It is still dark, and you don’t want to wake your roommate by turning on the light. You need to get a pair of socks from your sock drawer, which has six pairs of socks in it. The problem is that the socks are all white with different color borders, and it is too dark to see if you are pulling out a matching pair. Two pairs have red borders, two pairs have green borders, and two pairs have blue borders. How many socks must you take out of the drawer (and then take to the bathroom where you can close the door and turn on the light) in order to be sure that you have one matching pair? Use your deducing skills to figure this out. Then read on.

Broad framework: We need one sock more than the number of possible color combinations in order to have one matched pair.

Specific situation: The number of socks doesn’t matter.

Specific situation: There are only three different colored borders.

Deductive conclusion: We need take only four socks in order to guarantee a match with another sock. If the first three socks pulled out each had a different color border, the fourth sock would match one of the three.

Thinkers

Words in a Word

"Therein lies the secret," Shakespeare (or somebody) said. "For you see, there is a seven-letter word in the English language in which you can find nine words without rearranging any of its letters." What is the word?

Need a Hint?
The answer is in the statement of the question.

STANDARDS FOR THINKING AND REASONING

Identify the three most important critical thinking standards to be applied to the skill of deducing. Put a check (✓) next to your three choices. Be ready to explain your thinking. Why these three?

- | | | |
|----------------------------------|--------------------------------------|-------------------------------------|
| ☐ Clear | ☐ Specific | ☐ Relevant |
| ☐ Logical | ☐ Significant | ☐ Fair |
| ☐ Precise | ☐ Accurate | ☐ Consistent |
| ☐ Deep | ☐ Complete | ☐ Adequate |

Plants and Medicine

Joseph Levine and Kenneth Miller

A young leukemia patient resting peacefully in a cancer ward is thousands of miles away from the exotic island of Madagascar, which lies off the eastern coast of Africa. She and her hopeful parents, who have been told that the odds are good she will recover from the deadly cancer, may not know the location of that island, and they may not have heard of the Madagascar periwinkle (*Catharanthus rosea*), a plant with white and pink flowers native to the island. Nonetheless, the little girl may owe her life to this flower and to a compound extracted from it known as *vincristine*. Vincristine is a cellular poison that breaks down the mitotic spindle and makes it impossible for cells to complete cell division. Cancer cells, which divide rapidly, are particularly vulnerable to vincristine, and in the past decade or so the drug has become a powerful weapon in the medical arsenal with which patients are winning battle after battle in the war against childhood cancer.

Vincristine is just one example of a human dependence on plants that is much less obvious than our dependence on plants as sources of food. Plants are one of our most valuable sources of medicines, old and new. In many cases, well-known drugs are responsible for the effectiveness of folk remedies. Hindu folk medicine has made wide use of *Rauwolfia serpentina*, the snakeroot plant, as a treatment for circulatory and nervous disorders. From a careful analysis of the effects of this plant, researchers extracted *reserpine*, a drug often essential to the treatment of high blood pressure. The use of willow bark as a pain remedy is effective because the plant contains a close chemical relative of aspirin. The flowering foxglove contains *digitalis*, one of the most effective heart medicines known. It is estimated that more than 25 percent of the drugs prescribed for use in the United States contain plant materials as their active ingredients, and that percentage would be much larger if synthetic chemicals first discovered in plants were included in the total.

The possibilities of plants in medicine are almost limitless. For years, biologists have collected rare plant species from around the world with the hope of finding new medicines. The search has been long and costly, but it has also been rewarding. Sometimes success in that search comes from the commonplace: the polyacetylene poisons in marigolds hold great promise as antitumor drugs. But just as frequently, it comes from the exotic, as with *curare*, a potent muscle relaxant derived from the plant poisons used by Amazon natives on their blowgun darts.

Ironically, just as we develop the biochemical techniques to make the most of these botanical gifts, we may be on the verge of destroying the world's greatest storehouses of plant chemicals. The tropical rain forests, including the Amazon, are vanishing at an astonishing rate. As one acre after another is cleared for the quick gain of timber or for cultivation, the wild forests become ever smaller and the chances for discovery of rare plant species diminish. Sadly, the land beneath the forest is of little use for farming. So much of its nutrient content is tied up in vegetation that once it has been cleared, the land will support farming for no more than a few years. Recent estimates are that more than half the land cleared for the Amazon forest has now been abandoned. The farms and ranches come and go, but once a plant species has been lost, its potential for medical application is gone forever.

READ AND RESPOND

1. You have heard and read much about the vanishing rain forests and the loss of plant and animal species. Let's assume that nothing is being done to stop this loss. What are the implications for this generation? What are the implications for the next generation?
2. Is the loss of rain forests and valuable species important to society? Why do you think that? What is your proof that anyone even cares?

An Irish Laborer Confronts Hardship in San Francisco

Anonymous

[April, 1875]

I began work on the 12th instant in the Pacific Works. Ed Jones [is] foreman. What my wages is, I don't yet know and may not for some 6 weeks yet. If I could have what is coming to me each week, as it [is] earned, in a very little time I would have things all O.K. But, while I want money very badly, I cannot afford to forfeit my job. I have asked Lowell for the loan of some money which he has promised to let me have today. And, if he does, it will help to straighten matters a little. I must have money this coming week, come from where it may, because I have no fuel, and that alone is most indispensable. . . .

I am now indebted \$3.25 for wood and coal, \$15.00 for groceries and milk, \$1 for bread, \$5 on [the] stove, and \$1 borrowed, making a total of \$26.25. I have drawn \$10 on my 1st weeks payment which is now due. Two [are] being kept back. This will render it impossible for me to settle up all I could wish, but still I shall struggle through as well as I can. I shall have another month's rent to pay and probably \$5 more for groceries which makes \$48.25, not to speak of meat and other little eccteras. I shall then have only coming to me on the 15th [of] May [wages] for 14 days and 6 1/2 hours.

May, 1875

Sunday [the] 2nd is the molders' picnic. Would like to go but cannot for want of funds. Lowell is to call on that day, and [I] may get some money from him. [I] rely upon him but may again be disappointed. . . .

My wife's anticipated sickness (parturition) is not yet arrived which will leave me better prepared for the event when it does take place. Though, even then, I won't be as well off for her sake as I could wish, but, as it is, God be thanked for what we have. . . .

June, 1875

Business still continues to get dull, and but very little prospects of it being much better.

On the 17th my wife was confined, and at 7:15 A.M. another boy was born. Everything turned out all right. Mrs. McDevitt is evidently both skillful and considerate as a midwife.

Joe Whalley from Omaha called upon me on the 19th on his way to Seattle, W.T. [He] gives very discouraging accounts of that place and hopes largely from his new home. Since then, two molders, [the] Tenny brothers, have gone to Seattle, but Wharburton gives very discouraging accounts from that place. . . .

July, 1875

Moved to another house, No. 225 Perry St., owned by a man named Murphy. Rent \$17.00. I got laid off at the "Pacific" and began work in the "City" Iron Works. . . .

The crowds on the streets of persons from Salt Lake City would give me the impression of it being a doomed city.

It seems as if this climate was not going to agree with me. The variety of weather one gets in San Francisco in a day is enough to satisfy the most fastidious for almost a season.

I want still another change and again think it is for the better. Of one thing I am satisfied. Moulding is not the business for me to follow. While out of it, I can always do without drinking. And [I] can, too, for a time after returning to it. But, gradually, the feeling grows upon me, and I again begin to taste. I want to quit that practice if possible. And the only remedy I know of is to secure a position outside of the business altogether. . . .

August, 1875

Moved to No. 3 Margaret Place; rent \$13 per month.

Was laid off in [the] City foundry. I disliked the place all the time I was in it most thoroughly. . . .

During the month of August I did nothing, but [I] made \$11.50 on the election. This, with some credit and \$10 from Charley Butterfield, carried me through. . . .

September, 1875

Borrowed \$5 from A. Sloan, \$10 from G. McClelland, and \$10 from C. Lowell, also \$1 from E. Jones. Began work on Friday afternoon [the] 10th. . . .

On the last of the month, contrary to all expectations, [I] was laid off. . . .

[9] December, 1875

. . . With this month ends a year I had hoped from its auspicious beginning to terminate in a far different manner. But, while we hope still for the silver lining to the dark cloud of adversity, and as we think, we hope and work and toil for it, yet as time revolves on his unerring axis and brings not the mildest tinge of our fanciful lining, our hopes become tintured with despair. . . . And, with the beginning of another year, [so also] does our hopes ascend till perhaps, by patient, constant toiling [and] hopeful, steady perseverance

[which is] never wholly subdued by any obstacle, there comes a day in some bright year when we may gaze back on our labor and enter into the enjoyment of their results.

I began the year with very mild expectations, that of being out of debt by this time and of having my family, still increasing, better provided for. But, instead of clearing off my past indebtedness, I have added to it. And, while I still hope that another year will see me clearly out of debt, I confess I am somewhat doubtful. . . .

January, 1876

2nd In order to begin the New Year in a lucky, if not a more Christian manner, my wife insisted upon getting both Willie and the baby Christened today. Accordingly, I accompanied her to St. Mary's Cathedral for that purpose and accomplished it notwithstanding it was very cold for this climate and rained exceedingly. On our return home, we ate dinner and really felt happier than we had done for some[time] notwithstanding our poverty. The names given are William John and Edward Alfred.

3rd, 4th, and 5th Attended the Odd Fellows' Employment Office each day with no result.

6th & 7th Met Mr. Douglas, [the] freight agent [of the] Southern Pacific Railroad, who sent me to work at the Company's wharf where I helped to load cars with coal from noon till Friday night and earned \$5. . . .

13th and 14th No success thus far. As usual, I have visited those shops where I might reasonably hope to get a job, but the ill fortune which has persistently followed me for 25 months still clings to me as tenaciously as ever.

While I regret my circumstances, I am aware [that] others are a good deal worse off. I still keep house. Of course, in a poor fashion, but yet I manage to eat some and secure enough warmth and sleep. But, my wife and children [are] pent up from week to week, without a sufficiency of warmth or of warm clothing. They feel the effects of this mode of living, and it begins to tell upon them.

20th Began work this day in the Union Iron Works. I was afraid I was not going to begin work, but after a little [while], the foreman came to me and told me [that], if I wanted to work for \$3.50 a day, I could start. And, further, [he said] that he had orders to start no new men at any higher price. And so, I started. Worked the full day of 9 hours and all night and next day till quitting time. . . .

23rd Sunday. A most disagreeably wet day. I could not have gone out if I had to in consequence of my boots being very bad. In fact, both my wife and children as well as myself are [at] a very low ebb in clothing. During all of this day, [I] felt generally well pleased and, of course, was in good humor. [This was] the result of being employed and having some prospect ahead of not only being out of debt but being in a position to save a little money. My wife also feels in better condition than I have seen her for a long time from the same cause. I believe, or at least sincerely hope, she will pull with me [so] that, by the end of the year, we may have begun some provision for our children. . . .

31st Worked today 10 hours and made two pipes weighing about 700 lbs. The month of January terminates this day and has been productive of some benefit. I hope it is the precursor of better times than I have experienced in a long time. . . .

16th I have been suffering for 3 weeks past with a severe cold and have had a terrible cough. But today, I have had an intense pain in my left lung which may, if it continues, render it necessary for me to take a rest to recuperate if it don't assume a more serious character which, with God's help, I hope not for the sake of my young family. Worked 10 hours and produced 1,000 lbs. . . .

29th . . . This records the second month of this Centennial Year of Grace 1876, during which I have earned \$84.50 and produced 15 tons, averaging clear profit to the proprietors [of] \$450. . . .

March, 1876

. . . *19th Sunday.* Visited Maguire's Opera House last night with the wife and today being a beautiful day took the family out to 26th St. on the horse car. . . .

READ AND RESPOND

1. What difficulties did this Irish laborer face in attempting to live and work in San Francisco? Why didn't he leave and go to some other community where more jobs were available? Are there any people in the United States today who are facing similar difficulties? Are there more ways available to them to deal with these problems than were available to the Irish laborer?
2. Describe what life was like for this Irish laborer and his family as you imagine it. What are the implications and consequences of that kind of life?
3. Do things appear to be getting better for the Irish laborer by the end of the article? Support your answer with details from the article.

Dietary Rules and Meatless Fridays

James R. Kearl

<i>Species</i>	<i>Percentage change in price</i>
Sea scallops	-17
Yellowtail flounder	-14
Large haddock	-21
Scrod	- 2
Cod	-10
Ocean perch	-10
Whiting	-20
Average	-12.5

For hundreds of years, Roman Catholics were required to abstain from eating meat on Fridays. Traditionally, they ate fish instead. In February 1966, Pope Paul VI issued a decree that allowed local bishops to lift the requirement, except for those Fridays during Lent. The ban was lifted for American Catholics in December 1966. Did this change in nonmonetary incentives change behavior? Or, put differently, had the ban on meat actually affected behavior? In a study of the northeastern United States, where 45 percent of the population was Roman Catholic, one economist estimated that, after the ban on Friday consumption of meat had been lifted, the demand for fish changed, lowering the price by 12.5 percent, on average.

For seven different species of fish, the results were as shown in the table above.

Estimating these changes is not a simple matter. A study of this sort must account for the quantity of a particular fish caught; the quantity of a particular fish imported from other areas; the quantity of a particular fish already in storage and therefore available to be supplied to the market; personal income, and the price of meat and poultry. Nevertheless, the ban on meat had clearly affected fish consumption, because lifting the ban reduced demand.

READ AND RESPOND

1. When the American Council of Bishops decided that American Catholics could eat meat on Friday except for those Fridays in Lent, the council in other countries did not issue the same decree for the rest of the world. Why do you think "meatless Fridays" remained for non-Americans? What do you suppose the thinking was behind the council's decision? Does this suggest that the Catholic Church treats different people around the world differently?
2. What inferences are made in this article?
3. Can you suggest reasons for the drop in market price of fish that have nothing to do with "meatless Fridays," reasons that might better explain the price drop?

ASKING CRITICAL QUESTIONS

After you read the article that follows, what critical questions come to mind? Everything you read will stir up your thinking if you read and question critically. What questions would you like to have answered in order for you to put the article in proper context and to completely understand what is being said or reported? *On the lines following the article, write three questions that, if answered, will help you understand what is really being said.*

The Wilderness Transformed

Carolyn Merchant

By the late seventeenth century, much of New England was still covered by a vast forest, and thousands of settlers were clearing the woodlands, killing rattlesnakes, and building traps to catch the wolves that were destroying cattle. Even where the dangerous animals had been driven out, there were still “vast numbers of Frogs, toads, owls, bats, and other Vermin” at the edge of the uncleared land. But a short distance from the frontier—and especially in Boston—there were streets “full of Girls and Boys sporting up and downe, with a continued concourse of people,” and crafts that depended on timber products were thriving.

The shipbuilders of Boston were producing over half the shipping tonnage launched in New England, and shipbuilding had created a prosperous local trade in white and black oak, chestnut, larch, and red cedar framing timbers, in spruce and white pine trees for masts, and in pitch and tar. (Unlike their English counterparts, who were often forced to purchase timber abroad, Boston shipwrights could easily obtain even specially shaped trees for stems, sterns, and ribs.) Shipbuilding encouraged the development of a number of specialized woodworking industries as well—to build superstructures, install fittings, and decorate the vessels.

Cooperage also thrived in Boston and other seacoast towns. Because vast amounts of staves were collected at Boston for shipment overseas, it was never a problem to procure supplies there, and coopers made thousands of casks each year for shipbuilders, brewers, distillers, fishermen, and merchants. They also made wooden pails, churns, tubs, and other utensils for foreign markets and for the settlers.

As a meat-packing center and the major port of entry for hides from the West Indies, Boston was the tanning center of New England. The bark of young white oak trees was preferred for tanning cowhides, and although large numbers of such oaks could not be found everywhere in New England, enough tanbark was available in the coastal regions, especially south of Boston.

... By the end of the century, over half a million acres of woodland had been cleared for farming. In some regions sheep grazed on peaceful meadows reminiscent of the gentle English countryside, and English fruits, grains, and vegetables grew where dank, murky forests or swamps had been. In the open areas, such English plants as the daisy, buttercup, clover, chickory, hawkweed, and dandelion had replaced the native wild flowers, which, no longer protected by the trees, died from exposure to the sun.

The forest was the greatest obstacle to the expansion of agriculture, but it was also the source of timbers for houses, outbuildings, and fences—and of firewood, the ashes of which served as a fertilizer. And in many settlements farmers supplemented their meager incomes by producing timbers, staves, hoops, and shingles for the artisans and merchants of the port towns. They also made feeding troughs from elm logs, and plows, harrows, shovels, flails, and pitchforks of ash and oak. Ink was made from oak galls, and dyes from many species, among them the sumac, hickory, butternut, hemlock, ash, sassafras, dogwood, alder, birch, oak, and maple. Maple sugar and honey were also taken from the forest, for West Indian sugar was expensive. Wild cherries, wild plums, blueberries, and currants added variety to the settlers’ diet. From the forest, too,

came the bark and wood of the walnut, spruce, birch, and sassafras for making beer; nut oils for purgatives; the bark of the willow, oak, alder, and birch for suppuratives; cherry bark for cough remedies; and the sap of the white pine and hemlock for astringents.

On the edge of the forest there was good hunting, and game was part of the New England diet. The passenger pigeons and blackbirds that often attacked the cornfields were killed and eaten in large numbers, and in Connecticut so many deer were killed by 1698 that the General Court limited the hunting season. Whereas in England most people were forbidden to hunt with a gun, marksmanship was essential for survival in the New England forest. . . .

Pollution of the environment and waste of natural resources are often considered consequences of the Judeo-Christian belief that man should have dominion over all nature. And indeed, before John Winthrop set out for the American colonies, he wrote: "The whole earth is the Lords garden, and he hath given it to the sonnes of men, and with a gen[eral] Commission: Gen: 1:28: increace and multiplie, and replenish the earth and subdue it." But the seventeenth-century colonists' attitude toward nature was not as simple as that. Town records show that south of the Merrimack, where settlers were not wholly dependent on the sale of timber products they themselves could make, the cutting of timber trees was restricted by various laws. The system of land ownership in the early New England towns encouraged preservation of timber, for townships were granted to groups of men known as proprietors, who distributed land among themselves and other settlers but had the sole right to large tracts of common, or undivided, land held in reserve. Although the proprietors of a town allowed all of its inhabitants to take some building timber, fuel, and other essential wood from the common land, much of the valuable timber was reserved for the proprietors.

. . . Late in the seventeenth century, and even in the eighteenth century, after hundreds of thousands of acres of timberland had been destroyed, New Englanders seem to have noticed only a few of the many significant changes that resulted from the clear-cutting of the forests: drier air, stronger winds, the disappearance of small streams, and a decline in the number of wolves, bears, and other wild animals. They considered most of these changes beneficial.

MY CRITICAL QUESTIONS

1.

?

2.

?

3.

?

SOLUTIONS TO ITEMS IN THIS CHAPTER

Thinkers (p. 198)

Heroine.

Any Questions? (p. 200)

There is no missing dollar. The original \$30 is divided like this: the desk clerk has \$25, the three guests have \$3, and the bellhop has \$2. **Why is the problem so hard to figure out?** The way the problem is stated is misleading (and not good math or good accounting). Expenses and assets are added together to come up with an apparently missing \$1. An asset (\$2 kept by the bellhop) was added to an expense (\$27) rather than to the other assets (\$25 kept by the hotel and \$3 kept by the guests).

Thinkers (p. 201)

The statement was made on January 1. Suzie's birthday is December 31. She was nine on December 30 (the day before yesterday). She was ten on December 31 (yesterday). She will be eleven later this year. She will be twelve next year.

Thinkers (p. 209)

The two sums are equal.

Any Questions? (p. 211)

Gauging intellectual ability is difficult at best, but one way is to observe over a period of time what people know. If a person knows *what* happens, he or she likely has average intellectual ability; if a person knows *how* things happen, he or she has superior ability; if a person knows *why* things happen, he or she probably has exceptional intellectual ability.

Thinkers (p. 214)

The word is *short*. When you add two letters (*er*) to *short*, it becomes *shorter*.

Any Questions? (p. 217)

While pointing down one road, ask this question: "If I were to ask you if this is the correct way to Hana, would you answer yes?" The two men will end up giving you the same answer, "Yes," for the correct route to Hana. Are there any other questions that would work just as well?

Any Questions? (p. 225)

It takes 66 seconds—not 60 seconds. When Big Ben strikes six o'clock, there are five intervals between the first bell and the last bell. Each interval is 6 seconds (one-fifth of 30 seconds) long. When Big Ben strikes twelve o'clock, there are eleven intervals between the first and the last gong. Six seconds times eleven intervals equals 66 seconds.

Thinkers (p. 225)

The next letter is E. The complete sequence: O (one), T (two), T (three), F (four), F (five), S (six), S (seven), E (eight).

Thinkers (p. 227)

The word is *therein*, which contains *the, there, he, here, her, herein, rein, ere, in*.

PART IV

Research and Writing

Research and Writing

CHAPTER 9

Linda Stevens Hjorth

Your written work in college will help you discover that writing is more than an assignment; it is a way of life. Think about all the things you do on a daily basis that involve writing. The papers you write, the letters you send, the reports you create, and the job applications you fill out are examples of writing that is often taken for granted. In each case, you need to know how to place thoughts on paper effectively. Words must be spelled correctly, ideas must make sense, and syntax must be grammatically correct. The success of your writing depends on your knowledge, comfort level, and ability to communicate ideas in written words.

Part of being victorious in college is knowing how to write essays, reaction papers, and research papers. With the completion of each writing assignment, your comfort level and expertise in writing increase. Possessing effective writing strategies can help you get and keep jobs, attain promotions, and achieve career goals. The writing skills that you learn in college carry over to your career. They help you to write organized business reports, letters, and memos that are grammatically correct. For example, it is difficult to get a job without sending out well-written cover letters and résumés. Recruiters often throw away résumés that have spelling errors. Promotions into positions with increased responsibility demand effective writing capability. No one wants a manager who cannot communicate properly in writing.

This chapter presents ways to clarify writing assignments, follow steps for research papers, improve writing, combat writer's anxiety, and prevent plagiarism. The main focus of this chapter is the creation of essays and research papers. However, writing is not only something you do in college but also a great way to communicate, share ideas with others, and express feelings that may not be easy to say.

Writing is a way to make your ideas come alive. Experiment with writing. Practice. You may even enjoy it.

Clarify the Assignment

You have a writing assignment. Your instructor tells you to write a 750-word paper and hand it in next week. You write the assignment down as a priority on your to-do list and go home. As you sit in front of your computer and stare at the blank screen, you wait for the writing to happen. Many ideas pass through your mind, but you do not know where to begin.

The best place to start is with the instructor's original assignment. What type of paper has been assigned? Whatever the assignment, make sure you understand the

instructor's expectations. Each instructor will expect different things; by asking the right questions, you will understand more easily what you need to do.

- ▶ Is your paper supposed to be historical, autobiographical, biographical, theoretical, or scientific?
- ▶ Should your paper be informative, persuasive, informational, or research oriented?
- ▶ Is your paper based on fact or fiction?
- ▶ Will your instructor provide you with the topic, or must you pick one? If you are allowed to pick one, do you need to have it approved by your instructor?
- ▶ How many sources will you need? How do you cite them?
- ▶ How long should the paper be?
- ▶ What are your instructor's overall expectations for this assignment?

By clarifying the expectations of the instructor, you will find fewer roadblocks as you write. Most instructors want papers that are typed double-spaced, neat, and well organized with no spelling errors. In order to be creative in your writing endeavors, it is important to allow your creative juices to flow and not limit your writing with self-doubts.

Writing Guidelines

The following writing guidelines provide support and a basic foundation for your writing effort. As you write, use the guidelines as a gentle reminder to complete all of the steps of writing.

- ▶ Choose a subject.
- ▶ Narrow it into smaller topics.
- ▶ Write a thesis statement.
- ▶ Prepare an outline.
- ▶ Write a first draft. Cover all of the topics on your outline. Use headings and sub-headings.
- ▶ Spell the instructor's name correctly. Use the instructor's correct title (Professor, Mrs., Ms., Mr., Dr.).
- ▶ Proofread.
- ▶ Ask others for constructive criticism.
- ▶ Rewrite the paper (integrate suggestions).
- ▶ Check punctuation, grammar, and spelling.
- ▶ Be sure your paper is neat, organized, and understandable.
- ▶ Proofread, make corrections, and read again for last-minute changes.
- ▶ Hand in your final paper.

The following section explains the possible writing steps. Try them and see how they work for you. Writing is different for everyone. After using these steps once or twice, change the order, add new ones, subtract the ones that do not work. That way, you will be able to use the steps within your own writing style. These steps are set up for writing research projects. For writing projects that are not research-based, eliminate the "research" and "research notes" steps. The rest remain the same.

Important skills are involved in the process of writing a research paper: researching in the library, reading sources, taking notes from these sources, and writing the actual paper. Enough time must be allotted for each stage of the process. There should also be time to proofread the paper and make necessary revisions. The result should be a well-researched, well-written research paper.

Maele Seau, student
Columbia College, Columbia, Missouri

Writing Steps

Choose a Subject

Imagine that the instructor has asked you to write a research paper, report, or essay based on the environment. What would you write about? Sometimes it helps to create a list of all of the topics related to the subject recommended by the instructor. For example, you might choose to write about the environment. Which topic would you choose? Recycling, reducing waste, deforestation, the effects of the Chernobyl nuclear accident on the environment, polluted water tables, extinction of species, ozone depletion, or global warming? When you choose a subject that you like and that is of interest to you, the writing process seems more pleasant and less daunting.

Narrow the Subject

QUICK CHECK

What subject would be fun or interesting to write about?

How many topics can you list from your selected subject?

Most subjects that you choose initially will be very general. You will need to narrow down the subject to make it easier to write about. Otherwise, all of the available data can be overwhelming. It would be frustrating to start researching a subject and find that there are two hundred and forty articles available. Where would you begin?

Narrowing down a broad concept (a subject) into smaller parts (topics), before you begin writing will save you time and leave you less frustrated. When you narrow down your subject into smaller topics, and then choose one topic to write about, you can create a more focused paper.

Let us say, for example, that your psychology instructor assigns a five-page research paper on any theorist in the field of psychology. You could narrow your subject by choosing Sigmund Freud from a list that also includes John B. Watson, Carl Jung, B. F. Skinner, Edward B. Titchener, Carl Rogers, Abraham Maslow, and Wilhelm Wundt. After choosing Freud, you will need to narrow the topic further. You could decide to examine a few Freudian theories like unconscious conflict, dream interpretation, personality development, or psychosexual development. Finally, you could complete the narrowing process by choosing “psychosexual development” as your topic.

Write a Thesis Statement

Before you create a thesis statement, take time to read some sources on your topic, reflect, analyze, and understand the sources that you have reviewed. Write down or

A THESIS STATEMENT contains one or two sentences that state explicitly the focus of a writing assignment.

QUICK CHECK

Choose a topic.

Write a thesis statement based on your topic.

RESEARCHING means finding materials pertaining to your thesis statement.

type some notes from the original sources (remember to record full source citation data); your reactions to new theory, statistics, or ideas. Your reactions to others' written words strengthen your own writing skills. Trust your own thoughts and reflect upon them.

A thesis statement consists of one or two sentences that clearly state the focus of the writing assignment. It summarizes the main concepts to be presented and lets the reader know the order in which topics will appear in the paper. It is a helpful tool because it can keep you focused as you write. It also gives the reader a brief preview of what will be featured in your writing. The only time you would not use a thesis statement is in fiction or autobiographical writing. If the instructor asks that the thesis statement not be included in the final written paper, you may still want to write one for yourself to keep you focused as you write.

You may find as you write your paper that your thesis will change. The more information that you gather, the more likely you are to change your focus. It is possible that the thesis statement may not correlate to a newly written first draft. If this happens, change the thesis statement so that it reflects the new draft.

Do Research

Once your topic has been chosen and your thesis statement written, it is time to research. There are many ways to conduct research. Visit your library or investigate options on the Internet to see what kinds of information are available. Although the Internet provides you with a massive amount of information, it will be up to you to check resources in the library to be sure that the data you find on the Internet are accurate and factual.

Take pens, pencils, and a laptop computer (if you have one) to the library with you. In your library, you will find card catalogues, on-line catalogues, computer databases, inter-library loan, and much more.

Do not limit yourself to the written word. Also check out videos, laser disks, tapes, and CDs. A variety of community resources are also available to you. You could contact industries, art institutes, museums, village boards, chambers of commerce, zoos, and so on.

Interviews are a viable source of information. For example, if you were conducting research on the environment, you could interview someone at the local waste management company. Most companies are glad to have staff meet with you, as it is a way for them to market the good things they do. If you are not sure whom to call first, call the marketing or customer service department.

Take Research Notes

When conducting research, it is important that you record accurately *all* of the data pertaining to your sources. You may want to refer to the *MLA Handbook* (Gibaldi, 1995) or the *Publication Manual of the American Psychological Association* (1983) for citation style in your final bibliography. When creating your bibliographic information, remember that whether you find the information in books, journals, abstracts, periodicals, or specialized indexes, or on the Internet, your bibliographical notes should include the following:

- ▶ Journals and periodicals: subject and title of the article, author's name, magazine title, volume number, date of publication, and page number.
- ▶ Books and abstracts: title of book, author's and editor's names, name of publisher, place and date of publication, and page number.
- ▶ Internet: subject and title, author's name, and Web site address.

Both the *Publication Manual of the American Psychological Association* and *A Guide to MLA Documentation* (Trimmer, 1998) provide guidance in citing all types of references, including electronic sources.

If you use bibliography cards, one card (3" × 5") should be used for each source. You could use different card colors for different sources and number each bibliography card. After you have completed your bibliography cards, create 4" × 6" note cards. Find a large space on your desk or floor and fill it with all of the materials relating to your research. Write on each note card a main idea, a summary, relevant details, or a quote that you want to present in your paper. Place a brief source citation on each note card, or indicate the number of the bibliography card listing that source, so that you will not confuse various sources when you start your paper. Another option would be to use computer software that can organize bibliographical information.

Outline and Organize

- I. _____
 - A. _____
 - B. _____
- II. _____
 - A. _____
 - 1. _____
 - 2. _____
 - B. _____

Now that your research is done, one of the best ways to organize your collected information is to create an outline (see Chapter 5). Like thesis statements, outlines allow you to organize your paper without really writing it. They provide a quick look at whether your paper will flow, and how main and subordinate ideas will fit within the body of your paper. Like thesis statements, outlines can always be changed. However, the fundamental parts of the paper listed in the outline usually remain the same.

Place your notes in a topical order that makes sense to you. Use your notes to create your outline. The headings and subheadings included in your outline (based on the main ideas from your notes) will organize the paper for both the writer and the reader. Even if you eventually remove them from your final draft, they remain an important part of the organizing process.

Write a First Draft

Instructors Have Different Ideas about Outlines. Be Sure to Ask Your Instructor for Guidelines

Using your organized notes and outline, write the first draft of your assignment. Do not let this become a difficult or frustrating process. Record all ideas that come to mind. Do not edit or delete at this point. Just get something down on paper for each main and subordinate idea. This will generate a quantity of further ideas that will help you complete the project. You can always delete and elaborate later. Remember, this is not your final draft.

Write and write and write until you feel that you have filled in your outline with written material. Then go back and reorganize the writing until you are satisfied with the content. After you have done this, leave your paper for a period of at least twenty-four hours. Meanwhile, allow your mind to come up with new creative ideas to improve the quality of your work.

Proofread

Proofread your paper for correct spelling, punctuation, grammar, capitalization, and so on. Then leave it alone for another period of time. Review it again later. If you find no blatant errors, ask someone else, such as a family member, a friend, or a professional in the tutoring center at your college, to proofread it for you.

Seek Constructive Criticism

Others can provide you with pertinent feedback regarding your writing. Many professional writers belong to writing groups in which group members provide positive and negative feedback on each of the members' written pieces. Although it is difficult to hear criticism, comments from others will improve the quality of your writing. Study groups can increase writing awareness and skill. However, to offer group feedback effectively, it is important to focus the responses. One way to do this is to ask group members to respond to your writing by answering the following questions:

1. Does the introduction and conclusion reflect the essence of the entire work?
2. Are the ideas that are presented clear and concise? Are any parts of the writing confusing or in need of clarification?
3. Are more transitions needed? If so, what suggestions would you offer?

By answering these questions, the group can stay focused on the essentials of writing and not get lost in details or in ineffective criticism.

Seek Answers to Questions

There are many places to receive support when writing. Most campuses have writing centers or hotlines for quick questions. You can also receive help through the Internet, writer's reference guides [e.g., *The Rinehart Guide to Grammar Usage* (1993) and *The Chicago Manual of Style* (1993)] or various computer programs. Some academic support centers will also answer questions or help you solve writing problems. Ask your instructor what support services are available on your campus for writers.

Some instructors are willing to look over a draft and provide suggestions. Others like to look at your outline before you begin writing and then review your first draft. This is a good idea if you are unsure initially of your writing.

Students need to realize no piece of writing is ever perfect and that revisions can only help. They should be able to express their thoughts and ideas effectively on paper. This helps students project their ideas clearly to their reader.

**Robin Marie Carpenter, student
McHenry County College, Crystal Lake, Illinois**

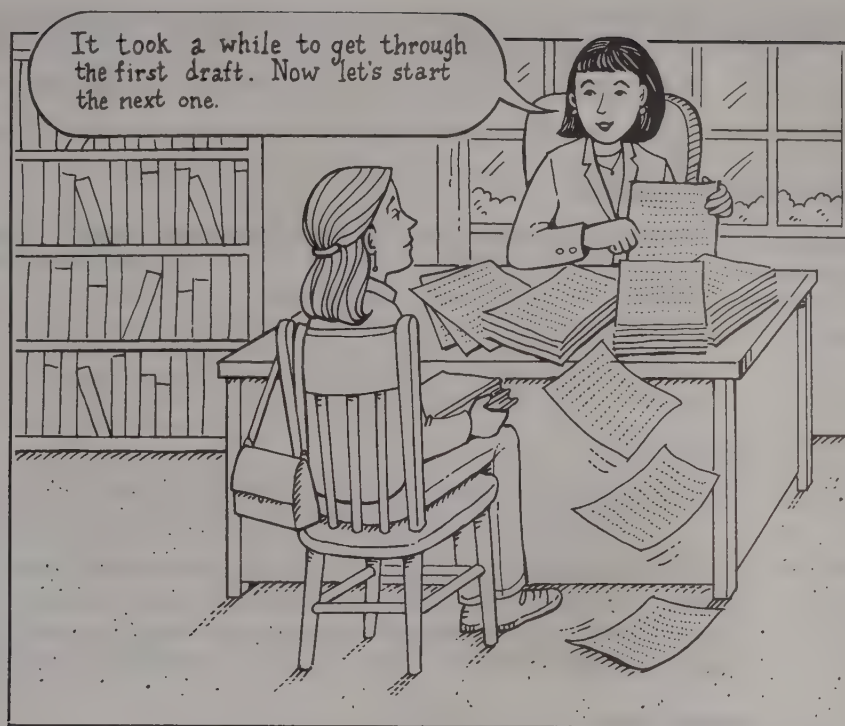
Revise

Make the appropriate revisions and get ready for the final draft. At some point, you have to become comfortable enough with the paper to move on. If you find yourself revising and revising, and never feeling satisfied with your product, stop. Put your paper away for a few hours, and if you find no major imperfections, get ready to write your final draft.

Write a Final Draft

This is it. The end of the road. All of the hours that you have put into this writing assignment will now pay off. Make your final content corrections, and lay the paper aside. Check it later for grammatical errors, awkward sentences, paragraph transitions, and completion of topic coverage. Review the writing checklist at the beginning of this chapter to make sure that you have effectively scrutinized the entire paper. Make appropriate corrections, and hand it in.

Some students are never happy with the finished product and thus never finish the paper. It may never be perfect in your eyes, but it *must* be handed in. You have given it your best.



EXERCISE

Writing Assignment

The purpose of this exercise is to provide you with practice in following the steps for writing assignments.

Choose a subject about which you would like to write a two to three page paper. Narrow the subject. Create a thesis statement. List two bibliographical sources that you will integrate into your paper. Create an outline of your paper, and organize your material. Write the first draft of the paper, ask for constructive criticism (include written feedback in your final paper), revise, and hand in a final draft.

Manage Your Attitude

It is easy to give up on writing when it does not seem to be happening as fast as you think it should. Take a quick break, but do not give up. When you stick with it, the writing ideas will begin to flow. Find ways to keep yourself motivated. Use positive reinforcers when you complete tasks (a walk, lunch with a friend, a sporting event). When you have a thought such as "I will never finish this paper," turn the negative thought into a positive one. Think, "I will finish two pages tonight and then see how much I can do tomorrow night."

Do not be hard on yourself when you write. Creativity comes from the heart and the mind. If you constantly censor your work, you will be stifling your creativity and productivity. Let your thoughts flow, and allow yourself to write.

Know that each time you complete a writing project successfully you are building skills to help you achieve your life goals. Writing is a part of school, of business,

and of creativity. Believe in your ability to write and create, learn from your mistakes, and try again. The more confidence you have in yourself, the more confidence will be expressed in your writing.

Combat Writer's Anxiety

WRITER'S ANXIETY is a physical, fearful reaction to any attempt to write.

Writer's anxiety is what you might be experiencing as you stare at the blank screen and try to put your thoughts into words. Your heart might palpitate, and you might wonder to yourself, "Can I really do this?" Writer's anxiety sometimes includes writer's block. That is the experience of feeling that no matter what you write, it is not right, or that no new creative ideas come into your mind as you write. Not everyone experiences writer's anxiety, but if you do, the following tips could help.

Free-writing

Free-writing is writing without censoring. If your mind seems frozen, try free-writing. Sit at the computer, or grab some paper and a pen, and write, write, write. Write for fifteen minutes (minimum) without stopping. Let every idea from the recesses of your mind get recorded on paper. Later, you can edit the information, but during the free-writing experience, no editing is allowed. It is an enjoyable way to unfreeze thoughts and create ideas of which you might not have been aware. This technique combats anxiety because it allows creative ideas to surface without censorship.

Free-talking

If you do not have time to sit and write down your free-floating ideas, then find a tape recorder, and while you are doing the dishes, working on the car, or sitting and enjoying a sunset, record all of the thoughts relating to your topic. Later, as you are writing, you can listen to the tape and take notes on any ideas that pertain to your paper. Free-talking is a great technique for busy people who do not have time to free-write. It also works well for people who create best when not focusing on just one task.

Write Yourself a Letter about Your Topic

This is a technique that gives you permission to write anything you want. It works because you know that no one but you will see it.

Read about the Topic

Record any ideas that come to mind as you read about the topic. Use those ideas later in your paper, remembering to cite sources. By reading and pondering others' ideas, your own creativity can be stimulated.

Change Your Writing Technique

If you are using the computer, take out a pen and paper. If you are writing in sentence form, change to sentence fragments, poems, or rap. This change often sparks new ideas. Just by changing the tools or place in which you write you may find that new ideas can be created.

Take a Break

If nothing else works, leave the writing and do something enjoyable. Go for a walk, work on a hobby, get a good night's sleep. When you return to your writing, the ideas might flow more easily. It is almost as if your brain is working on the ideas while you are physically doing something else. A break provides a fresh start on an old project.

EXERCISE

Combating Writer's Anxiety

The purpose of this exercise is to practice strategies that will decrease writer's block or writer's anxiety.

Choose three of the following strategies, and follow the directions within each one.

1. **Free-writing:** Choose a topic. Free-write for three minutes about the topic without censorship. After you have done this, list the concepts that are good enough to use in a paper.
2. **Free-talking:** Choose a topic. Tape record, for five minutes, all of your ideas about the topic. Create a list of ideas from free-talking that you could incorporate in a writing assignment. Hand in the tape and your written paper.
3. **Write yourself a letter:** Choose a topic that causes you to have mixed emotions or conflicting feelings. Write to yourself about them. What did you learn?
4. **Read about a topic:** Choose a topic. Find a source that relates to the topic on the Internet or in the library. Read for fifteen minutes and then correlate what you read to your topic. Write the correlations on a separate sheet of paper to be included in a writing assignment later.
5. **Change your writing technique:** Choose a topic, and see if writing in a different place or using different tools makes a difference in your creativity, productivity, or writing. Try writing in three different places.
6. **Take a break:** After you have been writing for a long time, leave the writing alone for twenty-four hours. Come back to it, and start to write again. Then record if the break made a difference.

PLAGIARISM

When you decide to present someone else's ideas as your own without giving the source, it is plagiarism.

- ▶ **When you use another's work, word for word, without providing the source, it is plagiarism.**
- ▶ **When you copy a report (full or partial) from another student, it is plagiarism.**
- ▶ **When you insufficiently paraphrase a paragraph without citing the source, it is plagiarism.**

Plagiarism is morally wrong, and most colleges and universities punish students who plagiarize. Sometimes, however, plagiarism occurs because you are not sure what should be cited and what should not. By following the Modern Language Association of America (MLA) or the American Psychological Association (APA) guidelines you will be less likely to make mistakes.

Before you plagiarize, remember that there is a tremendous pride that comes from creating a work that is totally your own. If you make the decision to plagiarize, you must also take personal responsibility for the punishment that could include failure on that specific project or failure in that class. Some colleges and universities dismiss or suspend students for repeated offenses.

Plagiarism is not only wrong, it does not allow you to create, learn, or advance. By choosing to plagiarize you are preventing yourself from participating in the educational system that you have worked so hard to enter. Professors do not like "cheats" and neither do employers.

PLAGIARISM is presenting someone else's ideas and words as your own, without source citations

This chapter has presented a variety of techniques that you can use in all of your writing endeavors. You will find that your writing improves as you read, research, outline, create, free-write, edit, rewrite, edit, and write again. Good writing comes from being willing to practice your writing skills until excellence permeates each written product.

Step Inside . . . The Library

The library is a great place to read, conduct research, study, relax, listen to tapes, learn new things, and have fun. Listed here are some of the resources you can find at the library.

On-Line Catalogue

Increasingly, the catalogue of library holdings is available on-line. The catalogue usually lists books, journals, reference materials, CDs, records, tapes, and other formats. The on-line catalogue has taken the place of the card catalogue in many libraries. The on-line catalogue will show you where materials are located and if they are available.

Computerized Databases

Databases are updated weekly or quarterly. They may have newspaper articles covering material on the local, national, and international levels. One educational database—Educational Resources Information Center (ERIC)—consists of abstracts of educational journals that are useful for research in teaching and education.

Other databases could include InfoTrac, Magazine Index, Business Index, corporate and executive profiles, management case studies, or industry analysis. By using a computer, you can access a list of subjects. When you find relevant ones, insert a CD, and the article may be available for your review on the screen. If the library has this information, you can print it out, but be aware that some libraries charge a fee for the printouts. Make sure that the original source is written on the printout so that you can cite it accordingly. If the library does not have the needed article, the staff may be able to order it for you.

Interlibrary Loan

If your library does not have a book that you need, a librarian can order it from another library and usually have it for you quickly. Clarify with the librarian how long it will take, as sometimes it takes days, and other times it takes months. There may be a fee for this service.

Encyclopedias

Encyclopedias offer basic research material that provides you with a foundation to start more specific research.

Next time you need a quiet place to study, do research, or just sit and think, check out your library.

Internet Exercise

Access the Web site for your college. Look up the school's policy on plagiarism, and answer the following questions.

1. What is your college's definition of plagiarism? In your own words provide two examples that would apply to this definition.

2. What is the penalty for plagiarizing?

3. What else does this Web site tell you about plagiarism?

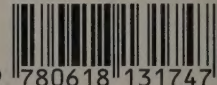


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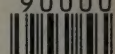
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